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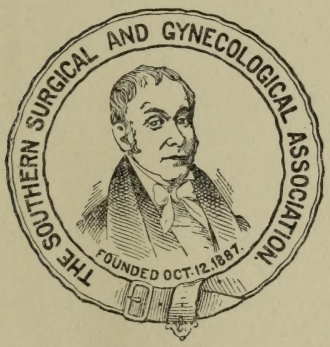

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TREASURER.

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THADDEUS A. REAMY, Cincinnati, Ohio.

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1889.	Hunter McGuire.	W. O. Roberts. *Bedford Brown.	W. E. B. Davis.	Hardin P. Cochrane.
1890.	George J. Engelmann.	Berthold E. Hadra. Duncan Eve.	W. E. B. Davis.	Hardin P. Cochrane.
1891.	Lewis S. McMurtry.	J. McFadden Gaston. J. T. Wilson.	W. E. B. Davis.	Hardin P. Cochrane.
1892.	J. McFadden Gaston.	Cornelius Kollock. George Ben Johnston.	W. E. B. Davis.	Hardin P. Cochrane.
1893.	*Bedford Brown.	Joseph Price. George A. Baxter.	W. E. B. Davis.	Hardin P. Cochrane.
1894.	*Cornelius Kollock.	A. B. Miles. J. B. S. Holmes.	W. E. B. Davis.	Hardin P. Cochrane.
1895.	Louis McLane Tiffany.	Ernest S. Lewis. Manning Simons.	W. E. B. Davis.	Richard Douglas.
1896.	Ernest S. Lewis.	Joseph Taber Johnson. Richard Douglas.	W. E. B. Davis.	A. M. Cartledge.
1897.	George Ben Johnston.	W. E. Parker. Floyd W. McRae.	W. E. B. Davis.	A. M. Cartledge.
1898.	Richard Douglas.	*H. H. Mudd. James A. Goggans.	W. E. B. Davis.	A. M. Cartledge.
1899.	Joseph Taber Johnson.	F. W. Parham. W. S. Robinson.	W. E. B. Davis.	A. M. Cartledge.
1900.	A. M. Cartledge.	Manning Simons. W. P. Nicolson.	W. E. B. Davis.	W. D. Haggard.
1901.	Manning Simons.	George H. Noble. L. C. Bosher.	W. D. Haggard.	Floyd W. McRae.
1902.	W. E. B. Davis.	J. Wesley Bovée. J. W. Long.	W. D. Haggard.	Floyd W. McRae.

* Deceased.

HONORARY MEMBERS.

1894.—Foy, George,	Dublin.
1894.—Jacobs, Charles,	Brussels.
1894.—Martin, A.,	Berlin.
1894.—Morisani, O.,	Naples.
1894.—Pozzi, S.,	Paris.

MEMBERS.

1897.—Ameiss, F. C., M.D. Clinical Professor of Gynecology, Missouri Medical College. 2804 Olive Street, St. Louis, Mo.

1894.—Baldridge, F. E., M.D. Huntsville, Ala.

1900.—Baldy, John Montgomery, M.D. Professor of Gynecology, Philadelphia Polyclinic; Surgeon to Gynecean Hospital; Gynecologist to Pennsylvania Hospital; Consulting Surgeon to Frederick Douglass Free Hospital. 1722 Chestnut Street, Philadelphia, Pa.

1901.—Baughman, Greer D., M.D. Lecturer on Hygiene; Demonstrator of Pathology; Demonstrator of Physiology; in charge of Gynecological Dispensary at Medical College of Virginia. 12 North Second Street, Richmond, Va.

1890.—Baxter, George A., M.D. Professor of Surgery in the Medical Department of Grant University; ex-President of the Tennessee State Medical Society; Fellow of the American Surgical Association. *Vice-President*, 1893. Chattanooga, Tenn.

1900.—Benedict, Samuel C., M.D. Ex-President of the Medical Association of Georgia; Professor of Medical Jurisprudence, Law School, University of Georgia. 9 East Broad Street, Athens, Ga.

1900.—Black, James Madison, M.D., B.S. Consulting Surgeon Southern Railway. West Church Avenue, Knoxville, Tenn.

1893.—Bloom, J. D., M.D. Surgeon-in-Charge, Charity Hospital; Consulting Surgeon, Touro Infirmary; Lecturer on Diseases of Children, Tulane University. New Orleans, La.

1901.—Boldt, Hermann J., M.D. Gynecologist to Post-Graduate Hospital, St. Mark's Hospital, German Polyclinic; Consulting Gynecologist, Beth Israel Hospital; Professor of Gynecology, Post-Graduate Medical School. 39 East Sixty-first Street, New York, N. Y.

1890.—Bosher, Lewis Crenshaw, M.D. Professor of Surgery in the Medical College of Virginia; Visiting Surgeon to the Old Dominion Hospital; Member of the American Association of Obstetricians and Gynecologists, and Association of American Anatomists. 717 East Franklin Street, Richmond, Va.

1895.—Bovée, J. W., M.D. Gynecologist to Columbia and Providence Hospitals; Clinical Professor, Medical Department of Columbian University; Fellow of American Gynecological Society; Honorary Member, Virginia Medical Society; Member of Washington Obstetrical Society, the American Medical Association, and the Medical and Surgical Society, District of Columbia. 1404 H Street, N. W., Washington, D. C.

1889.—Brokaw, Augustus V. L., M.D. Professor of Anatomy in the Missouri Medical College; Assistant to the Chair of Surgery and Senior Assistant Surgeon, St. John's Hospital. 3147 Washington Avenue, St. Louis, Mo.

1898.—Brown, George S., M.D. Ex-President Jefferson County Medical Society. Birmingham, Ala.

1897.—Bryson, John P., M.D. Professor of Genito-urinary Surgery, St. Louis Medical College; Surgeon to the St. Louis Mullanphy Hospital. 209 N. Garrison Avenue, St. Louis, Mo.

1899.—Burthe, L., M.D. 124 Baronne Street, New Orleans, La.

1900.—Byford, Henry T., M.D. Professor of Gynecology, College of Physicians and Surgeons (University of Illinois), Chicago; Professor of Clinical Gynecology, Northwestern University Woman's Medical School; Professor of Gynecology, Chicago Post-Graduate Medical School; Professor of Gynecology, Chicago Clinical School; Surgeon to Woman's Hospital; Gynecologist to Chicago West Side Hospital. Reliance Building, 100 State Street, Chicago, Ill.

1891.—Cartledge, Abiah Morgan, M.D. Professor of Gynecology and Abdominal Surgery, Louisville Medical College; Visiting Surgeon to the Louisville City Hospital; Surgeon to the Louisville Home of the Friendless; ex-President of the Louisville Medico-Chirurgical Hospital. *Treasurer*, 1895–1899; *President*, 1900. 205 West Broadway, Louisville, Ky.

1899.—Cathcart, R. S., M.D. Assistant to Chair of Clinical Surgery in the Medical College of the State of South Carolina. 66 Hasell Street, Charleston, S. C.

1893.—Cocram, Henry S., M.D. 124 Baronne Street, New Orleans, La.

1893.—Coley, Andrew Jackson, M.D. Councillor of the Medical Association of the State of Alabama. Alexander City, Ala.

Founder.—Copeland, Benjamin G., M.D. Professor of Anatomy and Clinical Surgery, Birmingham Medical College; Professor of Anatomy and Surgery, Birmingham Dental College; Surgeon and Gynecologist, Hillman Hospital. 224 Chalifoux Building, Birmingham, Ala.

1893.—Crofford, T. J., M.D. Professor of Physiology and Clinical Lecturer on Gynecology in the Memphis Hospital Medical College. 155 Third Street, Memphis, Tenn.

Founder.—Cunningham, Russell M., M.D. Professor of Practice of Medicine and Clinical Medicine, Birmingham Medical College; Surgeon to the Pratt Mines Hospital. Ensley, Ala.

1894.—Dandridge, Nathaniel Pendleton, M.D. Professor of Surgery, Miami Medical College; Surgeon to Cincinnati Hospital and Episcopal Hospital for Children. 422 Broadway, Cincinnati, Ohio.

Founder.—Davis, John D. S., M.D. Professor of Principles and Practice of Surgery and Clinical Surgery, Birmingham Medical College; formerly Gynecologist to Birmingham Hospital of United Charities; formerly Chairman of the Judicial Council of the Alabama Surgical and Gynecological Association; ex-President of the Jefferson County Medical Society and of the Board of Health. Avenue G and Twenty-first Street, Birmingham, Ala.

Founder.—Davis, William Elias B., M.D. Professor of Gynecology and Abdominal Surgery, Birmingham Medical College; ex-President of the Tri-State Medical Society of Alabama, Georgia, and Tennessee; Fellow of the American Association of Obstetricians and Gynecologists, and First Vice-President, 1895; President, 1901; formerly Chairman of the Section of Obstetrics and Diseases of Women, and Vice-President of the American Medical Association; Honorary Member of the Medical Society of the State of New York and of the Louisiana State Medical Association; Honorary President of Section on Abdominal Surgery, Pan-American Medical Congress, 1893, and Vice-President

of Congress of 1896; Fellow of the British Gynecological Society; formerly Surgeon to the Birmingham Hospital of United Charities. *Secretary*, 1887–1900. *President*, 1902. Avenue G and Twenty-first Street, Birmingham, Ala.

1891.—Dean, G. R., M.D. Fellow of the American Association of Obstetricians and Gynecologists; President of South Carolina State Medical Association; ex-President Association of Surgeons of Southern Railroads. Spartanburg, S. C.

1900.—Deaver, John B., M.D. Surgeon-in-Chief to the German Hospital 1634 Walnut Street, Philadelphia.

1901.—Dibrell, James A., M.D. Dean Medical Department, University of Arkansas. Little Rock, Ark.

1892.—Dixon, Archibald, M.D. Ex-President of the Kentucky State Medical Society; ex-President of the McDowell Medical Society; ex-President of the Mississippi Valley Medical Association. Henderson, Ky.

1897.—Dorset, Walter B., M.D. Professor of Obstetrics and Clinical Gynecology, Beaumont Hospital Medical College; Gynecologist to Missouri Baptist Sanitarium and to Evangelical Deaconess' Hospital. 3941 North Belle Place, St. Louis, Mo.

1896.—Doughty, W. H., M.D. Professor of Anatomy and Clinical Surgery, Medical Department, University of Georgia. 822 Greene Street, Augusta, Ga.

Founder.—Douglas, Richard, M.D. Ex-President of the Tri-State Medical Society of Alabama, Georgia, and Tennessee; Fellow of the American Association of Obstetricians and Gynecologists; Fellow of the British Gynecological Association. *Treasurer*, 1894–1895; *Vice-President*, 1896; *President*, 1898. 110 South Spruce Street, Nashville, Tenn.

1900.—Dunning, Lehman Herbert, M.D. Professor of Diseases of Women, Medical College of Indiana; Consulting Gynecologist to Indianapolis City Hospital and Dispensary. 431 North Alabama Street, Indianapolis, Ind.

1899.—Earnest, J. G., M.D. Professor of Clinical Gynecology, College of Physicians and Surgeons; formerly Professor of Gynecology, Southern Medical College; Visiting Gynecologist to the Grady Hospital. Atlanta, Ga.

1891.—Elkin, William Simpson, M.D. Professor of Operative and Clinical Surgery, Atlanta College of Physicians and

Surgeons; ex-President of the Atlanta Society of Medicine; Surgeon to Grady Hospital. 27 Luckie Street, Atlanta, Ga.

1900.—Ellis, James N., M.D. 19 Forest Avenue, Atlanta, Ga.

1889.—Engelmann, George J., M.D. Master in Obstetrics, Vienna; late Professor of Obstetrics and Diseases of Women, St. Louis Post-Graduate School; formerly Professor of Diseases of Women and Operative Midwifery, Missouri Medical College; President Boston Obstetrical Society, and American Gynecological Society, 1900; late President of the St. Louis Obstetrical and Gynecological Society, the International Congress of Gynecology, 1892 and 1896; Member of the London Obstetrical Society, British Gynecological Society, etc. *President*, 1890; *Council*, 1890–1902. 208 Beacon Street, Boston, Mass.

1898.—Fenner, E. D., M.D. First Assistant Surgeon, Charity Hospital; Lecturer on Diseases of Children, Tulane University of Louisiana. New Orleans, La.

1900.—Ferguson, Alexander Hugh, M.D. Professor of Surgery, Chicago Post-Graduate; Professor of Surgery, Medical Department (College of Physicians and Surgeons), University of Illinois. 10 Drexel Square, Chicago, Ill.

1901.—Fort, R. E., M.D. Superintendent Nashville Hospital. 1414 Sigler Street, Nashville, Tenn.

1895.—Fortier, S. M., M.D. Visiting Surgeon to Charity Hospital. 4422 St. Charles Avenue, New Orleans, La.

1895.—Fry, Henry D., M.D. Professor of Obstetrics, Georgetown University. 1601 Connecticut Avenue, N. W., Washington, D. C.

1890.—Gaston, James McFadden, M.D. Formerly Professor of Principles and Practice of Surgery in the Southern Medical College; Surgeon to Providence Infirmary; ex-Chairman of Surgical Section of the American Medical Association; Fellow of American Surgical Association; ex-President of American Academy of Medicine. *Vice-President*, 1891; *President*, 1892. Atlanta, Ga.

1900.—Gaston, J. McF., Jr., A.M., M.D. President of Alumni Association, Southern Medical College. 421 Capital Avenue, Atlanta, Ga.

1900.—Gerster, Arpad G., M.D. Attending Surgeon to Mt. Sinai Hospital; Consulting Surgeon to the German Hospital. 34 East Seventy-fifth Street, New York, N. Y.

1898.—Gessner, Hermann B., A.M., M.D. Chief of Clinic to Chair of Surgery, Tulane University of Louisiana; Visiting Surgeon, Charity Hospital; Demonstrator of Operative Surgery, Tulane University of Louisiana; Professor of Anatomy and Surgery, New Orleans College of Dentistry; Secretary Louisiana State Medical Society; First Vice-President Orleans Parish Medical Society. 124 Baronne Street, New Orleans, La.

1897.—Glasgow, Frank A., M.D. Professor of Clinical Gynecology of St. Louis Medical College; Gynecologist to St. Louis Mullanphy Hospital; on Staff of Mission Baptist Sanitarium and of Martha Parsons Free Hospital; Consulting Surgeon to St. Louis Female Hospital. 3894 Washington Boulevard, St. Louis, Mo.

Founder.—Goggans, James A., M.D. Ex-President of the Tri-State Medical Society of Alabama, Georgia, and Tennessee; Senior Councillor of the Medical Association of the State of Alabama; Fellow of the British Gynecological Society. *Vice-President*, 1888. Alexander City, Ala.

1900.—Goldsmith, W. S., M.D. 262 Jackson Street, Atlanta, Ga.

1899.—Goode, Rhett, M.D. Mobile, Ala.

Founder.—Graham, Joseph, M.D. Member Charlotte, North Carolina, Medical Society; ex-Member North Carolina State Board of Health, and North Carolina State Board of Medical Examiners; ex-President North Carolina State Medical Society. Charlotte, N. C.

1892.—Grant, Horace H., M.D. Professor of Surgery in the Hospital College of Medicine; Surgeon to the Louisville City Hospital. 321 Equitable Building, Louisville, Ky.

1896.—Gwathmey, Lomax, M.D. Attending Gynecologist to St. Vincent Hospital and Dispensary. Norfolk, Va.

Founder.—Hadra, Berthold Ernest, M.D. Formerly Professor of Surgery, Texas Medical College and Hospital; ex-President of the West Texas Medical Association. *Vice-President*, 1890. Dallas, Texas.

1896.—Haggard, William David, M.D. Professor of Gynecology, Medical Department, University of Tennessee; Professor of Gynecology and Abdominal Surgery, University of the South (Sewanee); Gynecologist to Nashville City Hospital; ex-President Nashville Academy of Medicine; ex-Secretary Sec-

tion on Obstetrics and Diseases of Women, American Medical Association (1898); ex-Secretary Medical Society State of Tennessee (1897–1901); Member of American Association of Obstetricians and Gynecologists, and Alumni Association of Woman's Hospital of New York. *Treasurer*, 1900; *Secretary*, 1900–1902. 302 North Vine Street, Nashville, Tenn.

1892.—Hall, Rufus Bartlett, A.M., M.D. Professor of Clinical Gynecology in the Miami Medical College; Gynecologist to the Presbyterian Hospital; ex-President of the Cincinnati Obstetrical Society; ex-President of the American Association of Obstetricians and Gynecologists; Fellow of British Gynecological Society; Member of the American Medical Association and of the Ohio State Medical Society. 628 Elm Street, Cincinnati, O.

Founder.—Hardon, Virgil Orvin, M.D. Professor of Obstetrics and Diseases of Women and Children, Atlanta College of Physicians and Surgeons; Gynecologist to the Grady Hospital and to St. Joseph's Infirmary; Member of Medical Association of Georgia; ex-Member of American Gynecological Society; ex-President of Atlanta Society of Medicine. *Member of Council*, 1888–1893. 283 Peachtree Street, Atlanta, Ga.

1901.—Hazen, Charles M., M.D. Professor of Physiology, Medical College of Virginia. Bon Air (Richmond), Va.

1896.—Heflin, Wyatt, M.D. President of the Jefferson County Medical Society. Birmingham, Ala.

Founder.—Herff, Ferdinand, M.D. 308 East Houston Street, San Antonio, Texas.

1889.—Hill, Robert Somerville, M.D. Councillor of the Alabama State Medical Association; ex-President of the Medical and Surgical Society of Montgomery County; formerly Surgeon of Second Regiment Alabama State Troops. Montgomery, Ala.

Founder.—Hogan, S. M., M.D. Grand Senior Councillor and ex-Vice-President of the Medical Association of the State of Alabama. Montgomery, Ala.

1900.—Hoke, Michael, M.D., B.E. 268 Peachtree Street, Atlanta, Ga.

1891.—Holmes, J. B. S., M.D. Ex-President of the Tri-State Medical Society of Alabama, Georgia, and Tennessee; ex-President of the Georgia Medical Association; Fellow of the American Association of Obstetricians and Gynecologists. Atlanta, Ga.

1900.—Horsley, John Shelton, M.D. El Paso, Texas.

1896.—Hundley, J. Mason, M.D. Associate Professor of Diseases of Women and Children, University of Maryland; President Clinical Society of Baltimore. 1009 Cathedral Street, Baltimore, Md.

1892.—Hunter, H. M., M.D. Union Springs, Ala.

1900.—Ill, Edward Joseph, M.D. Surgeon to the Woman's Hospital; Medical Director, St. Michael's Hospital; Gynecologist and Supervising Obstetrician, St. Barnabas' Hospital; Consulting Gynecologist, German Hospital and Beth Israel Hospital of Newark, N. J.; to All Souls' Hospital, Morristown, N. J., and to Mountain Side Hospital, Montclair, N. J.; Vice-President from New Jersey to Pan-American Congress of 1893. 1002 Broad Street, Newark, N. J.

1888.—Jelks, James Thomas, M.D. Professor of Gynecology and Syphilology in Barnes Medical College, St. Louis; formerly Professor of Genito-Urinary Surgery and Venereal Diseases in College of Physicians and Surgeons, Chicago; ex-President of Arkansas Medical Society; ex-Secretary Section on Obstetrics and Diseases of Women, American Medical Association; Member of Chicago Medical Society, Mississippi Valley Medical Association, American Association of Obstetricians and Gynecologists; ex-Chairman of Section on Anatomy and Surgery, American Medical Association; Physician and Surgeon, Ozark Sanitarium; Surgeon-General Arkansas National Guards. 218 Central Avenue, Hot Springs, Ark.

1889.—Johnson, Joseph Taber, M.D. Professor of Gynecology and Abdominal Surgery, Georgetown University; formerly Gynecologist to Providence Hospital; Chief of Service of Gynecology and Abdominal Surgery, Georgetown University Hospital, and President of the Board of Administration; President of the Woman's Dispensary, and of the Medical Society of the District of Columbia (1887); Member of the British Medical Association; Fellow of the Gynecological Society; President of the Washington Obstetrical and Gynecological Society; Secretary American Gynecological Society, 1886–1890; President, 1899. *President*, 1899. 926 Farragut Square, Washington, D. C.

Founder.—Johnston, George Ben, M.D. Formerly Consulting Surgeon to the Richmond Eye, Ear, and Throat Infirmary; ex-President of the Richmond Academy of Medicine and

Surgery; ex-President of the Medical Society of Virginia; Member of the American Medical Association; Member of the American Association of Obstetricians and Gynecologists, and First Vice-President, 1896; Member of the Ninth International Medical Congress; Member of the American Surgical Association; late Professor of Anatomy in the Medical College of Virginia, and now Professor of the Practice of Surgery and Clinical Surgery; Surgeon to the Old Dominion Hospital; Honorary Member of the State Veterinary Medical Association; Consulting Surgeon to the City Free Dispensary. *Vice-President*, 1892; *President*, 1897. 407 East Grace Street, Richmond, Va.

1901.—Johnston, Robert W., M.D. Professor of Surgery, Baltimore Medical College. Corner Franklin and Cathedral Streets, Baltimore, Md.

1890.—Kelly, Howard Atwood, M.D. Founder of Kensington Hospital, Philadelphia; Associate Professor of Obstetrics, University of Pennsylvania, 1888–89; Professor of Gynecology and Obstetrics, Johns Hopkins University, 1888–99; Professor of Gynecology, Johns Hopkins University; Gynecologist-in-Chief to Johns Hopkins Hospital; Membre Associé Étrander de la Société Obstétricale et Gynecologique de Paris; Correspondirendes Mitglied der Gesellschaft f. Geburtshülfe zu Leipzig; Honorary Fellow Edinburgh Obstetrical Society, Royal Academy of Medicine (Ireland), and British Gynecological Society; Member Washington Academy of Sciences; Fellow American Gynecological Society. 1418 Eutaw Place, Baltimore, Md.

1895.—Kime, Rufus R., M.D. Ex-President Atlanta Society of Medicine; Ex-President of Atlanta Obstetrical Society; Ex-President of the Tri-State Medical Society of Alabama, Georgia, and Tennessee. 308 English-American Building, Atlanta, Ga.

1899.—Kohlman, William, M.D. 3500 Prytania Street, New Orleans, La.

1897.—Laidley, L. H., M.D. Surgeon to the Protestant Hospital; Professor of Gynecology and Pelvic Surgery, Beaumont Hospital Medical College; Member of the American Association of Obstetricians and Gynecologists; Member of the American Medical Association. 503 Charleton Building, St. Louis, Mo.

1899.—Larue, F. A., M.D. Chief of Clinic to the Chair of Surgery, Tulane University of Louisiana; Lecturer on Operative

Surgery, New Orleans Polyclinic; Visiting Surgeon to Charity Hospital. 624 Gravier Street, New Orleans, La.

1889.—Le Grand, John C., M.D. Ex-Vice-President of the American Medical Association; President of the Medical Association of the State of Alabama. 111 North Twentieth Street, Birmingham, Ala.

1894.—Leigh, Southgate, M.D. Visiting Surgeon St. Vincent's and Norfolk Protestant Hospitals; First Vice-President Medical Society of Virginia, 1899–1900; Surgeon to Norfolk and Western Railroad; Member American Medical Association, and Tri-State Medical Association of the Carolinas and Virginia, and Seaboard Medical Association. 147 Granby Street, Norfolk, Va.

1893.—Lewis, Ernest S., M.D. Professor of Gynecology, Medical Department of Tulane University. *Vice-President*, 1894; *President*, 1896; *Member of Council*, 1896–1901. 124 Baronne Street, New Orleans, La.

1893.—Lewis, Hampton S., M.D. 124 Baronne Street, New Orleans, La.

1900.—Lloyd, Samuel, M.D. Professor of Surgery, New York Post-Graduate Medical School; Attending Surgeon, Post-Graduate Hospital, and to the Babies' Wards. 24 West Fiftieth Street, New York, N. Y.

1899.—Loeber, F., M.D. Chief Surgeon Touro Infirmary and Member of Board of Administrators of Charity Hospital. 1419 Entelpe Street, New Orleans, La.

Founder.—Long, John W., M.D. Emeritus Professor of Gynecology and Pediatrics in the Medical College of Virginia; formerly Gynecologist to the Old Dominion Hospital and the Richmond City Dispensary; Honorary Member of the Alumnæ Association of the Medical College of Virginia; Consulting Surgeon to the Watts Hospital, Durham; Member, ex-Orator, and ex-Vice-President of the North Carolina Medical Society; Honorary Member of the Randolph County Medical Society; Member of the Rowan County Medical Society. *Vice-President*, 1902. Salisbury, N. C.

1900.—MacDonald, Willis G., M.D. Professor of Surgery (Adjunct), Albany Medical College; Surgeon to Albany Hospital; Chief Surgeon of South End Dispensary, etc. 29 Eagle Street, Albany, N. Y.

1895.—McGannon, M. C., M.D. Professor of Gynecology, Medical Department, University of Nashville. 301 North Spruce Street, Nashville, Tenn.

1893.—McGuire, Stewart, M.D. Professor of the Principles of Surgery and Clinical Surgery, University College of Medicine; Surgeon-in-Charge, St. Luke's Hospital; Visiting Surgeon, Virginia Hospital; Consulting Surgeon, Virginia Home for Incurables. 518 East Grace Street, Richmond, Va.

1891.—McGuire, William Edward, M.D. 411 East Grace Street, Richmond, Va.

1888.—McMurtry, Lewis S., M.D. Professor of Gynecology and Abdominal Surgery, Hospital College of Medicine, Louisville; Gynecologist to St. Mary and St. Elizabeth Hospital; Gynecologist to Gray Street Infirmary; ex-President of the American Association of Obstetricians and Gynecologists; ex-President of the Kentucky State Medical Society; Corresponding Member of the Gynecological Society of Boston; Fellow of the British Gynecological Society; Ordinary Fellow of the Edinburgh Obstetrical Society. *President*, 1891; *Member of Council*, 1892–1904. 1912 Sixth Street, Louisville, Ky.

1888.—McRae, Floyd Willcox, M.D. Professor of Gastro-Intestinal, Rectal, and Clinical Surgery, Atlanta College of Physicians and Surgeons; Surgeon to Grady Hospital; ex-President Medical Association of Georgia; ex-Secretary of Section on Surgery and Anatomy, American Medical Association; Member American Medical Association. *Treasurer*, 1900–1902. 63½ Whitehall Street, Atlanta, Ga.

1900.—Manton, Walter Porter, M.D. Gynecologist to Harper Hospital, Eastern and Northern Asylum for the Insane; Consulting Gynecologist to St. Joseph's Retreat; Vice-President of Medical Board of the Woman's Hospital and Infants' Home; Professor of Clinical Gynecology and Adjunct Professor of Obstetrics, Detroit College of Medicine, etc. 32 Adams Avenue, Detroit, Mich.

1891.—Marcy, Henry Orlando, M.D., LL.D. Ex-President of the American Medical Association; President of the Section of Gynecology, Ninth International Medical Congress; late President of the American Academy of Medicine; Corresponding Member of the Medico-Chirurgical Society of Bologna,

Italy; Fellow of the American Association of Obstetricians and Gynecologists. 336–338 Boylston Street, Boston, Mass.

1899.—Martin, Edmund Denegre, M.D. Professor of Minor and Clinical Surgery, New Orleans Polyclinic; Visiting Surgeon to the Charity Hospital; Consulting Surgeon to the Eye, Ear, Nose, and Throat Hospital; Surgeon to N. O. N. E. R. R. Co.; Chairman Surgical Section State Medical Society; President Orleans Parish Medical Society. 115 Chartres Street, New Orleans, La.

1899.—Mastin, William M., M.D. Fellow of the American Surgical Association; Member of the American Association of Genito-Urinary Surgeons; Surgeon to the Mobile City Hospital. Joachim and Conti Streets, Mobile, Ala.

1893.—Matas, R., M.D. Professor of Surgery, Medical Department of Tulane University; Fellow of the American Surgical Association. 624 Gravier Street, New Orleans, La.

1896.—Matthews, William P., M.D. Professor of Anatomy, Medical College of Virginia; Orthopedic Surgeon to the Old Dominion Hospital. Richmond, Va.

Founder.—Meriwether, Frank T., M.D. Assistant Surgeon, U. S. A. Retired. Asheville, N. C.

1899.—Michinard, P. E., M.D. 624 Gravier Street, New Orleans, La.

1888.—Miller, C. Jeff., M.D. Chief of Clinic to the Chair of Diseases of Women and Obstetrics, Tulane University of Louisiana; Lecturer on Gynecology and Obstetrics in New Orleans Polyclinic; Visiting Gynecologist to Charity Hospital. 1719 Jackson Avenue, New Orleans, La.

1899.—Milliken, Samuel E., M.D. 449 Elm Street, Dallas, Texas.

1901.—Mixter, Samuel Jason, M.D. Surgeon, Massachusetts General Hospital; Consulting Surgeon, Massachusetts Charity Eye and Ear Infirmary; Instructor of Surgery, Harvard Medical School. 180 Marlborough Street, Boston, Mass.

1900.—Morris, Robert Tuttle, M.D. Professor of Surgery, New York Post-Graduate Medical School and Hospital. 58 West Fifty-sixth Street, New York, N. Y.

1901.—Mullally, Lane, M.D. Demonstrator of Anatomy and Lecturer on Diseases of Children, Medical College State of South Carolina. Charleston, S. C.

1891.—Murfree, James Brickle, M.D. Professor of Surgery, University of the South (Sewanee); ex-President of the Tennessee State Medical Society, and of the Tri-State Medical Society of Alabama, Georgia, and Tennessee. Murfreesboro, Tenn.

1894.—Murphy, J. B., M.D. Professor of Surgery, Northwestern University; Professor of Surgery, Post-Graduate School and Hospital; Attending Surgeon to Cook County and Mercy Hospitals. 100 State Street, Chicago, Ill.

Founder.—Nash, Herbert Milton, M.D. Consulting Surgeon to the Retreat for the Sick (Hospital), Norfolk; Consultant to the Staff of St. Vincent's Hospital; ex-President of the Norfolk City Medical Society; Member of the State Board of Medical Examiners of Virginia. 296 Freemason Street, Norfolk, Va.

1899.—Neff, Wallace, M.D. Formerly Adjunct Professor of Clinical Surgery and Surgical Pathology, Medical College of Ohio (University of Cincinnati); late Major and Brigade Surgeon U. S. V. 1337 K Street, Washington, D. C.

1891.—Nelson, H. T., M.D. Member of the Medical Examining Board of Virginia. Charlottesville, Va.

1889.—Nicolson, William Perrin, M.D. Professor of Anatomy and Clinical Surgery, Atlanta College of Physicians and Surgeons. Prudential Building, Atlanta, Ga.

1896.—Noble, Charles P., M.D. Surgeon-in-Chief, Kensington Hospital for Women; Consulting Surgeon, Woman's Hospital; Lecturer on Gynecology, Philadelphia Polyclinic. 1500 Locust Street, Philadelphia, Pa.

1890.—Noble, George H., M.D. Ex-President of the Georgia Medical Association; ex-Secretary of Obstetrical Section of the American Medical Association. 131 South Pryor Street, Atlanta, Ga.

1890.—Nunn, R. J., M.D. Savannah, Ga.

1901.—Ochsner, A. J., M.D. Professor of Clinical Surgery, Northwestern University Woman's Medical School; Surgeon-in-Chief Augustina and St. Mary's Hospital. 710 Sedgwick Street, Chicago, Ill.

Founder.—Paine, John Fannin Young, M.D. Dean and Professor of Obstetrics and Diseases of Women and Children in the Texas Medical College and Hospital; Fellow of the American Association of Obstetricians and Gynecologists; ex-President

of the Texas Medical Association. 2177 Market Street, Galveston, Texas.

1888.—PARHAM, F. W., M.D.. Professor in the New Orleans Polyclinic. 1429 Seventh Street, New Orleans, La.

1900.—PARK, ROSWELL, M.D. Professor of Surgery, Medical Department, University of Buffalo; Surgeon, Buffalo General Hospital; Member German Congress of Surgeons, Italian Surgical Society, American Surgical Association, American Orthopedic, and American Genito-Urinary Associations. 510 Delaware Avenue, Buffalo, N. Y.

1893.—PARKER, WILLIAM E., M.D. Visiting Surgeon to the Charity Hospital. *Vice-President*, 1897. 124 Broad Street, New Orleans, La.

1899.—PERKINS, W. M., M.D. Chief of Clinic Chair of General Clinical and Operative Surgery, New Orleans Polyclinic; Assistant Demonstrator of Operative Surgery, Medical Department, Tulane University of Louisiana; Visiting Surgeon to the Charity Hospital. 205 Baronne Street, New Orleans, La.

1899.—PLATT, WALTER BREWSTER, M.D. Surgeon to the Robert Garrett Hospital for Children. 802 Cathedral Street, Baltimore, Md.

1889.—POLK, WILLIAM M., M.D. Dean and Professor of Obstetrics and Gynecology, Cornell University Medical College; Gynecologist to Bellevue Hospital; Consulting Surgeon to St. Luke's, St. Vincent's, New York Lying-in, and Trinity Hospitals; ex-President of American Gynecological Society, and New York Obstetrical Society. 7 East Thirty-sixth Street, New York.

1900.—PORTER, MILES F., M.D. Trustee of American Medical Association. 47 West Wayne Street, Fort Wayne, Ind.

1889.—POTTER, WILLIAM WARREN, M.D. Consulting Gynecologist to the Woman's Hospital; Consulting Surgeon to the Buffalo General Hospital; President and Examiner in Obstetrics, New York State Medical Examining and Licensing Board; Chairman of Section of Obstetrics and Diseases of Women, American Medical Association, 1890; President of the Buffalo Obstetrical Society, 1884–1886; President of the Medical Society of the State of New York, 1891; Executive President of the Section of Gynecology and Abdominal Surgery, Pan-American Medical College, 1893. 284 Franklin Street, Buffalo, N. Y.

1894.—Powell, Seneca D., M.D., LL.D. Professor of Surgery, New York Post-Graduate Medical School and Hospital, and Secretary to the Faculty; Visiting Surgeon to the Post-Graduate Hospital and to St. Mark's Hospital. 12 West Fortieth Street, New York, N. Y.

1889.—Price, Joseph, M.D. Physician-in-Charge of the Obstetrical and Gynecological Department of the Philadelphia Dispensary; Fellow of the American Association of Obstetricians and Gynecologists; ex-Chairman, Section of Diseases of Women and Obstetrics, American Medical Association. *Vice-President*, 1893. 241 North Eighteenth Street, Philadelphia, Pa.

1900.—Pryor, William Rice, M.D. Professor of Gynecology, New York Polyclinic; Consulting Gynecologist, St. Elizabeth's Hospital and to New York City Hospital; Fondateur Congress Internationale Gynecologie et d'Obstetrique; Member American Gynecological, New York Obstetrical, and New York Pathological Societies; Fellow Academy of Medicine; Member Society Alumni, Bellevue Hospital. 121 East Thirty-eighth Street, New York, N. Y.

1899.—Quinn, W. A., M.D. Henderson, Ky.

1900.—Ransohoff, Joseph, M.D., F.R.C.S. Professor of Anatomy and Clinical Surgery, Medical College of Ohio; Surgeon to Cincinnati, Good Samaritan, and Jewish Hospitals; Member American Surgical Association. 706 Walnut Street, Cincinnati, Ohio.

1890.—Reamy, Thaddeus Asbury, M.D., LL.D. Professor of Clinical Gynecology, Medical College of Ohio (Medical Department, University of Cincinnati); Gynecologist to Good Samaritan Hospital; Consulting Gynecologist to Christ's Hospital; ex-President to Cincinnati Academy of Medicine and Cincinnati Obstetrical Society; Member American Medical Association; ex-President Ohio State Medical Society and American Gynecological Society. 609 Oak Street, Cincinnati, Ohio.

1890.—Reed, Charles Alfred Lee, M.D. Ex-President of the American Medical Association; Professor of Gynecology and Abdominal Surgery in the Cincinnati College of Medicine and Surgery; Surgeon to the Cincinnati Free Hospital for Women; Fellow of the American Association of Obstetricians and Gynecologists; Fellow of the British Gynecological Society; ex-Chairman of the Section on Obstetrics and Diseases of Women

of the American Medical Association; Secretary-General of the Pan-American Medical Congress, 1893; Honorary Member of the Medical Society of the State of New York. Corner Seventh and Race Streets, Cincinnati, Ohio.

1900.—Rees, Charles M., M.D. Professor of Obstetrics, Charleston Medical School; Gynecologist to Shirro's Dispensary. Charleston, S. C.

1899.—Richardson, Maurice Howe, M.D. Visiting Surgeon to the Massachusetts General Hospital; Assistant Professor of Clinical Surgery, Harvard Medical School. 224 Beacon Street, Boston, Mass.

1901.—Ricketts, Edwin, M.D. Professor of Abdominal Surgery and Gynecology at the Cincinnati Polyclinic; Member of the American and British Medical Associations; Vice-President of the American Association of Obstetricians and Gynecologists. 415 Broadway, Cincinnati, Ohio.

1888.—Roberts, William O., M.D. Professor of Principles of Surgery and Clinical Surgery, Medical Department of the University of Louisville; formerly Secretary of the Surgical Section of the American Medical Association. *Vice-President*, 1889. 1520 Third Street, Louisville, Ky.

1901.—Robins, Charles Russell, M.D. Lecturer on Gynecology, Instructor in Gynecology and Abdominal Surgery, Attending Obstetrician, Outside Obstetrical Department, Medical College of Virginia; Local Surgeon, Atlantic Coast Line Railroad. 17 North Fifth Street, Richmond, Va.

1889.—Robinson, William Lovaille, M.D. Fellow of the American Association of Obstetricians and Gynecologists; ex-President of the Danville Medical Society; Member of the Medical Examining Board of Virginia; ex-President of Virginia Medical Society. 753 Main Street, Danville, Va.

1892.—Rodman, William L., M.D. Professor of the Principles of Surgery and Clinical Surgery in the Medico-Chirurgical College. 1626 Spruce Street, Philadelphia, Pa.

1901.—Rogers, Mack, M.D. Birmingham, Ala.

Founder.—Rogers, William Boddie, M.D. Professor of the Practice of Surgery and Clinical Surgery, Memphis Hospital Medical College; ex-Vice-President of the American Medical Association and National Association of Railway Surgeons. Porter Building, Memphis, Tenn.

1901.—Rosser, Charles M., M.D. Dean, Medical Department, University of Dallas; ex-President Texas State Medical Association. 506 North Texas Building, Dallas, Texas.

1890.—Royster, Hubert A., A.B., M.D. One of the Visiting Staff of the Rex Hospital; Surgeon-in-Charge of St. Agnes' Hospital. Tucker Building, Raleigh, N. C.

1901.—Runyan, Joseph P., M.D. 203 West Second Street, Little Rock, Ark.

1893.—Saunders, Bacon, M.D. Professor of Surgery and Clinical Surgery and Dean of Faculty of Medical Department, Fort Worth University; Chief Surgeon Fort Worth and Denver City Railway and of Wichita Valley Railway; Division Surgeon, Texas Pacific Railway, Gulf, Colorado, and Santa Fe Railway, and St. Louis and Southwestern Railway; ex-President Texas State Medical Association; Member American Medical Association and the International Association of Railway Surgeons, etc. Ninth and Houston Streets, Fort Worth, Texas.

Founder.—Schilling, Nicholas, M.D. Cedar Bayou, Texas.

1893.—Senn, Nicholas, M.D., Ph.D., LL.D. Professor of Practice of Surgery and Clinical Surgery, Rush Medical College; Professor of the Practice of Surgery, Chicago Polyclinic; Attending Surgeon, Presbyterian Hospital; Surgeon to St. Joseph's Hospital; ex-President of the American Surgical Association and of the American Medical Association. 532 Dearborn Avenue, Chicago, Ill.

1899.—Shands, A. R., M.D. Professor of Orthopedic Surgery, Columbian University. 1328 New York Avenue, N. W., Washington, D. C.

Founder.—Shivers, Offa Lundsford, M.D. Councillor of the Alabama Medical Association. Marion, Ala.

1893.—Simons, Manning, M.D. Professor of Clinical Surgery, Medical College, State of South Carolina; Surgeon to St. Francis Xavier's Infirmary; Surgeon to City Hospital; ex-President Medical Society of South Carolina; ex-Vice-President Tri-State Medical Society of Virginia and the Carolinas. *Vice-President*, 1895 and 1900; *President*, 1901. 111 Church Street, Charleston, S. C.

1892.—Simons, T. Grange, M.D. Ex-President of the South Carolina Medical Association; Member of the State Board of

Health of South Carolina; formerly President of the Charleston County Medical Society. Charleston, S. C.

1900.—Simpson, Frank Farrow, M.D. Assistant Gynecologist to Mercy Hospital; Gynecologist to Out-patient Department, Mercy Hospital. 524 Pennsylvania Avenue, Pittsburg, Pa.

1894 —Smith, Reginald K., M.D. Surgeon U. S. Navy. 507 Harrison Street, San Francisco, Cal.

1899.—Smythe, Frank Davie, M.D. Surgeon to St. Joseph's Hospital; Assistant Professor of Surgery, Memphis Hospital Medical College; Demonstrator of Operative Surgery; formerly Member of the State Board of Examiners of Mississippi. Porter Building, Memphis, Tenn.

Founder.—Souchon, Edmond, M.D. Professor of Anatomy and Clinical Surgery, Medical Department of Tulane University; Member of the American Surgical Association; President Louisiana State Board of Health. 135 Baronne Street, New Orleans, La.

Founder.—Stone, Isaac Scott, M.D. Clinical Professor of Gynecology, Georgetown University; Gynecologist of Columbia Hospital; Member American and British Gynecological Societies; Honorary Fellow of Medical Society of the State of New York; Fellow of the Medical Society of Virginia; Member Washington Academy of Sciences, Washington Obstetrical and Gynecological Society, Medical Society, and Medical and Surgical Society of the District of Columbia. 1449 Rhode Island Avenue, N. W., Washington, D. C.

1894.—Talley, D. F., M.D. Ex-President Jefferson County Medical Society; Professor of Materia Medica and Lecturer on Surgery, Birmingham Medical College, Birmingham, Ala.

Founder.—Taylor, Benjamin W., M.D. Ex-President of Columbia Medical Society and of South Carolina State Medical Association; Chief Surgeon Columbia Hospital; President of Board of Regents, South Carolina Hospital for the Insane; Consulting Surgeon South Carolina Hospital for the Insane; Member of the National Railway Surgeons and American Medical Associations; ex-Member State Board of Medical Examiners. 1409 Plain Street, Columbia, S. C.

Founder.—Taylor, Hugh M., M.D. Professor of Practice of Surgery and Clinical Surgery, University College of Medicine;

Surgeon to the Virginia Hospital; ex-President of the Virginia Board of Medical Examiners. 6 North Fifth Street, Richmond, Va.

1898.—Taylor, William Wood, A. B., M.D. Gynecologist to St. Joseph's and the Memphis City Hospitals. 246 Randolph Building, Memphis, Tenn.

1892.—Thompson, J. E., M.D. Professor of Surgery in the University of Texas. Galveston, Texas.

1891.—Tiffany, Louis McLane, M.D. Professor of Surgery in the University of Maryland; Fellow of the American Surgical Association. *President*, 1895. 831 Park Avenue, Baltimore, Md.

1890.—Tompkins, Christopher, M.D. Professor of Obstetrics in the Medical College of Virginia. 116 East Franklin Street, Richmond, Va.

1888.—Tuholske, Herman, M.D. Professor of Surgery, Medical Department, Washington University; Consulting Surgeon, St. Louis City Hospital; Surgeon to St. Louis Polyclinic Hospital, etc. 410 North Jefferson Street, St. Louis, Mo.

1893.—Vander Veer, Albert, M.D. Professor of Clinical, Didactic, and Abdominal Surgery, Albany Medical College; Fellow of the American Surgical Association; ex-President of the American Association of Obstetricians and Gynecologists; ex-President of the Medical Society of the State of New York. 28 Eagle Street, Albany, N. Y.

1891.—Walker, Edwin, M.D., Ph.D. Gynecologist to the Evansville City Hospital; ex-President of the Indiana State Medical Society; Fellow of the American Association of Obstetricians and Gynecologists. 712 Upper Fourth Street, Evansville, Ind.

1898.—Watkins, Isaac Lafayette, M.D. President of the Montgomery County Medical and Surgical Society. Montgomery, Ala.

1901.—Werder, X. O., M.D. Gynecologist, Mercy Hospital, Pittsburg; Professor of Gynecology, West Pennsylvania Medical College; Consulting Surgeon to the South Side Hospital, Allegheny General Hospital, St. Francis' Hospital, etc. 524 Pennsylvania Avenue, Pittsburg, Pa.

1888.—Westmoreland, Willis F., M.D. Professor of Surgery, Atlanta College of Physicians and Surgeons. 241 Equitable Building, Atlanta, Ga.

1900.—Williams, Ennion G., M.D. 315 East Grace Street, Richmond, Va.

1900.—Williams, Howard J., A.B., A.M., M.D. Surgeon to Macon Hospital; Chief Surgeon to M., D. & S. R. R.; Surgeon to Central of Ga. R. R., So. Rwy. and Ga. R. R.; ex-President of the Medical Association of Georgia, etc. 550 Orange Street, Macon, Ga.

1900.—Williams, J. Whitridge, A.B., M.D. Professor of Obstetrics, Johns Hopkins University; Pathologist to Woman's Hospital of Maryland. 845 Park Avenue, Baltimore, Md.

1897.—Williams, Robert F., M.D. Professor of Materia Medica and Therapeutics, and Clinical Lecturer on Practice of Medicine, Medical College of Virginia; Visiting Physician to Old Dominion Hospital, and City Free Dispensary. 508 East Grace Street, Richmond, Va.

Founder.—Wilson, J. T., M.D. Ex-President of the North Texas Medical Association; President of the Texas Medical Association; Superintendent of the State Hospital for the Insane. *Vice-President*, 1891. Terrell, Texas.

1891.—Wyeth, John Allen, M.D. President of the American Medical Association, 1902. Professor of Surgery in the New York Polyclinic; Consulting Surgeon to St. Elizabeth's Hospital; Visiting Surgeon to Mt. Sinai Hospital and Polyclinic Hospital; Honorary Member of the Texas State Medical Association; President of the New York State Medical Association; ex-President of the New York Pathological Society. 19 West Thirty-fifth Street, New York, N. Y.

1900.—Wysor, John C., M.D. Surgeon-in-Charge, C. & O. Hospital. Clifton Forge, Va.

1900.—Young, Hugh H., M.D. Chief of Clinic, Genito-Urinary Surgery, Johns Hopkins Hospital. 1005 North Charles Street, Baltimore, Md.

CONSTITUTION.

ARTICLE I.

The name of this Association shall be The Southern Surgical and Gynecological Association.

ARTICLE II.

The object of this Association is to further the study and practice of surgery and gynecology among the profession of the Southern States.

ARTICLE III.

This Association shall adopt and conform to the Code of Ethics of the American Medical Association.

ARTICLE IV.

Section 1. Any reputable physician who practises surgery or gynecology, and who is vouched for by two members of the Association and recommended by the Council, shall be eligible to membership in this body.

Sec. 2. The honorary members shall not exceed ten in number, and shall enjoy all the privileges of other members, excepting to vote or hold office, but shall not be required to pay any fee.

ARTICLE V.

Section 1. The officers of this Association shall be a President, two Vice-Presidents, a Secretary, a Treasurer, and a Council, elected by ballot.

Sec. 2. The President and Vice-Presidents shall be elected for one year, and the President shall not be eligible for re-election at any time; the Secretary and Treasurer, each, for five years; and the Council as provided for in the By-laws.

ARTICLE VI.

SECTION 1. It shall be the duty of the President to preside at all meetings of the Association; to give the casting vote; to see that the rules of order and decorum be properly enforced in all deliberations of the Association; to sign the approved proceedings of each meeting, and to approve such orders as may be drawn upon the Treasurer for expenditures ordered by the Association.

SEC. 2. In the absence of the President the first Vice-President shall preside, and in his absence the second Vice-President shall preside.

SEC. 3. In the absence of all three, the Association shall elect one of its members to preside *pro tem.*

SEC. 4. It shall be the duty of the Secretary to keep a true and correct record of the proceedings of the meetings; to preserve all books, papers, and articles belonging to the archives of the Association; to attest all orders drawn on the Treasurer for moneys appropriated by the Association; to keep the account of the Association with its members; to keep a register of the members, with the dates of their admission and places of residence. He shall collect all moneys due from the members and pay to the Treasurer, taking his receipt for the same. He shall report such unfinished business of previous meetings as may appear on his books requiring action, and attend to such other business as the Association may direct. He shall also supervise and conduct all the correspondence of the Association, and edit the TRANSACTIONS under the direction of the Council.

SEC. 5. It shall be the duty of the Treasurer to keep a correct record of all moneys received from the hands of the Secretary, giving his receipt for the same; pay them out by order of the Association as indorsed by the President and attested by the seal in the hands of the Secretary.

SEC. 6. It shall be the duty of the President of the Association to appoint an Auditing Committee, consisting of three members of the Association, whose duty it shall be to examine the books of the Secretary and Treasurer, and report on the same on the last day of the session.

ARTICLE VII.

Vacancies occurring in the offices of the Association shall be filled by appointment of the President until the next meeting. He shall also have the appointment of all committees not otherwise provided for.

ARTICLE VIII.

This Constitution shall take effect immediately from the time of its adoption, and shall not be amended except by a written resolution, which shall lie over one year, and receive a vote of two-thirds of the members present.

ARTICLE IX.

Any member who for three consecutive years fails to attend the meetings shall be dropped from the roll of membership.

BY-LAWS.

ARTICLE I.

The Southern Surgical and Gynecological Association shall meet annually on the second Tuesday of November at 10 A.M., at such place as may be designated by the preceding meeting.

ARTICLE II.

The members present shall constitute a quorum for business.

ARTICLE III.

The annual dues of each member shall be $10, paid in advance.

ARTICLE IV.

The usual parliamentary rules governing deliberative bodies shall govern the business workings of this Association.

ARTICLE V.

All questions before the Association shall be determined by a majority of the votes present.

ARTICLE VI.

The President shall deliver an annual address at each meeting of the Association.

ARTICLE VII.

The Secretary of the Association shall receive, at each annual Session, a draft from the President, drawn on the Treasurer, for the sum of $250 for services rendered the Association, and to this shall be added the necessary expense incurred in the discharge of his official duties.

ARTICLE VIII.

It shall be the duty of the Secretary, one month prior to the annual meeting, to notify the members of the Association, and urge their attendance.

ARTICLE IX.

The authors of papers shall notify the Secretary, six weeks prior to the meeting, of the titles of their essays, so that they may be incorporated in the preliminary programme.

ARTICLE X.

COUNCIL.

The Council shall consist of five members; and of those elected at the primary meeting, the first shall serve five years, the second four, the third three, the fourth two, and the fifth one year; so

that subsequently one member of the Council shall be elected annually to serve five years. The President and Secretary shall be *ex-officio* members of the Council.

This Council shall organize by electing a Chairman and Secretary, and shall keep a record of its proceedings.

The duties of this Council shall be—

1. To investigate applications for membership and report to the Association the names of such persons as are deemed worthy.

2. To take cognizance of all questions of an ethical, judicial, or personal nature, and upon these the decision of the Council shall be final; *provided*, that appeal may be taken from such decision of the Council to the Association, under a written protest, which protest shall be sustained by the Association, and the matter shall then be referred to a special committee, with power to take final action.

3. All motions and resolutions before the Association shall be referred to the Council without debate, and it shall report by recommendation at as early an hour as possible.

ARTICLE XI.

The President shall appoint at each annual meeting a Committee of Arrangements.

ARTICLE XII.

The Council shall have full power to omit from the published TRANSACTIONS, in part or in whole, any paper that may be referred to it by the Association, unless specially instructed to the contrary by the Association, which will be determined by vote.

ARTICLE XIII.

Any member failing to pay his dues for more than one year shall be dropped.

ARTICLE XIV.

No paper shall be read before this Association which does not deal strictly with a subject of surgical or gynecological importance.

ARTICLE XV.

No paper read before the Association shall be published in any medical journal or pamphlet for circulation, as having been read before the Association, without having received the indorsement of the Council.

ARTICLE XVI.

The reading of papers shall be limited to twenty minutes each, except by permission of the Association.

MINUTES OF THE PROCEEDINGS

AT THE

FOURTEENTH ANNUAL MEETING

OF

THE SOUTHERN

SURGICAL AND GYNECOLOGICAL

ASSOCIATION,

HELD AT THE

ROBERT E. LEE HALL,

Richmond, Va.,

NOVEMBER 12, 13, AND 14, 1901.

FOURTEENTH ANNUAL MEETING.

FIRST DAY.—*Tuesday, November* 12, 1901.

The following-named members were present:

BOSHER, LEWIS CRENSHAW	RICHMOND, VA.
BOVÉE, J. W.	WASHINGTON, D. C.
BROWN, GEORGE S.	BIRMINGHAM, ALA.
CATHCART, R. S.	CHARLESTON, S. C.
DAVIS, W. E. B.	BIRMINGHAM, ALA.
DEAN, G. R.	SPARTANBURG, S. C.
DOUGLAS, RICHARD	NASHVILLE, TENN.
FERGUSON, ALEX. HUGH	CHICAGO, ILL.
FRY, HENRY D.	WASHINGTON, D. C.
HAGGARD, WILLIAM D.	NASHVILLE, TENN.
HALL, RUFUS BARTLETT	CINCINNATI, OHIO.
HARDON, VIRGIL ORVIN	ATLANTA, GA.
ILL, EDWARD J.	NEWARK, N. J.
JELKS, JAMES THOMAS	HOT SPRINGS, ARK.
JOHNSON, JOSEPH TABER	WASHINGTON, D. C.
JOHNSTON, GEORGE BEN	RICHMOND, VA.
LEIGH, SOUTHGATE	NORFOLK, VA.
LEWIS, ERNEST S.	NEW ORLEANS, LA.
LONG, JOHN W.	SALISBURY, N. C.
McGUIRE, STUART,	RICHMOND, VA.
McMURTRY, LEWIS S.	LOUISVILLE, KY.
McRAE, FLOYD WILLCOX	ATLANTA, GA.
MATTHEWS, WILLIAM P.	RICHMOND, VA.
MORRIS, ROBT. T.	NEW YORK CITY, N. Y.
NELSON, H. T.	CHARLOTTESVILLE, VA.
NOBLE, CHARLES P.	PHILADELPHIA, PA.
PLATT, WALTER B.	BALTIMORE, MD.
POTTER, WILLIAM W.	BUFFALO, N. Y.
PRICE, JOSEPH,	PHILADELPHIA, PA.
REAMY, THADDEUS A.	CINCINNATI, OHIO.
ROBERTS, WILLIAM O.	LOUISVILLE, KY.
RODMAN, WILLIAM L.	PHILADELPHIA, PA.

ROGERS, WILLIAM B.	MEMPHIS, TENN.
ROYSTER, HUBERT A.	RALEIGH, N. C.
SAUNDERS, BACON	FORT WORTH, TEXAS.
SIMONS, MANNING	CHARLESTON, S. C.
SIMPSON, FRANK FARROW	PITTSBURG, PA.
STONE, ISAAC SCOTT	WASHINGTON, D. C.
TALLEY, D. F.	BIRMINGHAM, ALA.
TAYLOR, HUGH M.	RICHMOND, VA.
TIFFANY, LOUIS McLANE	BALTIMORE, MD.
TOMPKINS, CHRISTOPHER	RICHMOND, VA.
VANDER VEER, ALBERT	ALBANY, N. Y.
WATKINS, ISAAC L	MONTGOMERY, ALA.
WILLIAMS, ROBERT F.	RICHMOND, VA.
WYSOR, JOHN C.	CLIFTON FORGE, VA.
YOUNG, HUGH	BALTIMORE, MD.

NEW MEMBERS PRESENT.

BAUGHMAN, GREER D.	RICHMOND, VA.
MIXTER, SAMUEL J.	BOSTON, MASS.
RICKETTS, EDWIN	CINCINNATI, OHIO.
ROBINS, CHARLES R.	RICHMOND, VA.
ROSSER, CHARLES M.	DALLAS, TEXAS.

Morning Session.—The Association convened in the Robert E. Lee Hall at 10.30 A.M., and was called to order by the president, Dr. Manning Simons, of Charleston, S. C.

Dr. George Ben Johnston, Chairman of the Committee of Arrangements, was introduced and said: It is customary on occasions of this sort for the Association to receive a formal welcome by a brief address on the part of some distinguished citizen, and while we do not feel that such a thing is necessary, we fully realize the fact that it is better to conform to this usage, and I have the pleasure of introducing to you the Honorable Eppa Hunton, a member of the Constitutional Convention, one of Virginia's most distinguished and gifted sons. (Applause.)

ADDRESS OF WELCOME BY HONORABLE EPPA HUNTON.

Mr. President and Gentlemen of the Southern Surgical and Gynecological Association: Dr. Johnston has presented me as a member of the Constitutional Convention, but he has failed to tell you what he told me, namely, that my remarks must be limited to about five minutes. Probably he drew his inspira-

tion from the length of life of the Constitutional Convention. (Laughter.)

It is always a pleasure to Virginians to welcome those whom they respect and honor. It seems to me that there is a significance in the selection of a layman to welcome this distinguished body of scientists. It evidences the fact that of all professions and callings, of all classes and conditions, in this age of progress, of science, and of development, the great strides that you have made toward the relief of suffering humanity and in the progress of science are recognized by all people the world over. Again, I would say, that while the returning hero is welcomed by the applause of the people of the whole country and by the gratitude of the Government of that country, unless perchance he should belong to the Navy of the United States (laughter), and while the applause of the multitude has the sweetest sound for the successful public men, and their true fame is writ in mortar, their popularity is as evanescent as the day; but you, distinguished physicians and scientists, who have made wonderful strides in your profession and rapid progress that is unequalled in any other respect, the gratitude of suffering humanity is yours and the affection and the respect of the people in their hearts and their homes are the rewards of your successful progress and your labors. Layman as I am, I know that the men of the South have made the most remarkable records and reputations in the peculiar branch of science to which you belong. What is more appropriate, therefore, than that you should meet in the capital city with its history and its memories, as a guest of a city around which centred more than one-third of a century ago all hopes and aspirations of a brave, chivalric, and manly people, a city alike known in history, and noted for its earnest and cordial hospitality. These people, my friends, receive you with open arms, and whether you come from the East or the West, from the North or the South, the people of Virginia with open hearts and great earnestness receive you in their midst, and bid you God speed in your noble work of relieving suffering humanity and advancing the science to which you have devoted your lives. (Applause.)

The five minutes that has been allotted to me have expired. I hope your deliberations will be pleasant and profitable, and I assure you that you will receive the cordial and unstinted hospitality of the people of Richmond. (Applause.)

RESPONSE TO THE ADDRESS OF WELCOME BY PRESIDENT SIMONS.

Gentlemen: I feel sure that I voice the earnest sentiments of the Southern Surgical and Gynecological Association in expressing to the people of Virginia and of Richmond and the members of the local medical profession our warm appreciation of the cordial and earnest welcome that we have received at the hands of the gentleman who has just spoken. The hospitality of Virginia and Virginians is well known throughout the length and breadth of this broad land. The hospitality of the Southern people is a tradition; it is a type of Southern hospitality. I feel, therefore, it is a privilege that has been extended to us to receive at the hands of Virginians and the people of Richmond the warm welcome that has been extended to this Association on the present occasion. It is a privilege to be in Virginia, the mother of patriots, statesmen, and soldiers, and in the city of Richmond, around which cluster the dearest recollections of many Southerners. Virginia is noted for its cultivated, educated, and refined women, and its brave and intelligent men.

Again, I thank you for the warm and cordial welcome to the city of Richmond. (Applause.)

Dr. George Ben Johnston, Chairman of the Local Committee of Arrangements, made the following report:

REPORT OF THE COMMITTEE OF ARRANGEMENTS.

Gentlemen: Your Chairman desires to express thanks to his colleagues for their general co-operation in preparing for your meeting, and to acknowledge the debt he is under to the local members for their assistance, which has been so freely given. It is a source of much gratification and pride to those of us resident here that you should have chosen Richmond as your place of holding this your fourteenth session. This feeling is participated in by the profession, as well as by our citizens in general. We welcome you most cordially, and trust that your brief sojourn among us may be a pleasant one.

When you were invited to meet in Richmond we expected our beautiful and luxurious Jefferson Hotel to be your headquarters and place of assembly. When this magnificent establishment

was destroyed by fire on March 29th, a calamity befell us which will not soon be repaired. By reason of this destruction we are obliged to quarter you in a less commodious building, which necessitates you going from under your roof to hold your sessions, and in other respects somewhat cramps you. Although you may be somewhat inconvenienced by this arrangement, we shall strive to give you such a hearty welcome as to soften what otherwise might be a disappointment.

The members and guests of the Association are expected to make use of the Westmoreland and Commonwealth Clubs, which have extended them the usual privileges of visitors.

The local members have provided entertainment and refreshment for you as follows:

Tuesday, November 12th, 1 P.M., lunch, 508 East Grace Street; 8 to 12 P.M., reception at Dr. Taylor's, 6 North Fifth Street.

Wednesday, November 13th, 1 P.M., lunch, at Dr. Johnston's, 407 East Grace Street; 9 to 12 P.M., Dr. Bosher's reception, Westmoreland Club, Sixth and Grace Streets.

Thursday, November 14th, 1 P.M., lunch, at 508 East Grace Street.

On Wednesday afternoon, from 5 to 6.30, a tea will be tendered the visiting ladies at 508 East Grace Street.

On motion, the report of the Committee of Arrangements was accepted, and a vote of thanks extended to the Chairman.

Papers were then read as follows:

1. "Laceration of the Cervix and its Consequences," by Dr. E. S. Lewis, of New Orleans, La.

Discussed by Drs. Watkins, McMurtry, Reamy, Price, and the discussion closed by the essayist.

2. "Vaginal Puncture or Incisions for Puriform Disease or Exploratory Purposes are Unsurgical Procedures," by Dr. Joseph Price, of Philadelphia, Pa.

Discussed by Drs. Noble, Hall, Haggard, McMurtry, Ricketts, Brown, and the discussion closed by the essayist.

On motion, the Association adjourned until 2.30 P.M.

Afternoon Session.—The Association reassembled at 2.30 P.M., and was called to order by the President.

On motion, the local members of the medical profession and

other visitors were invited to take part in the discussions on papers.

3. "Treatment of Pelvic and Abdominal Tumors Complicating Pregnancy, with Report of Cases," by Dr. Rufus B. Hall, of Cincinnati, Ohio.

Discussed by Drs. Hardon, Noble, Haggard, and the discussion closed by the essayist.

4. "A Unique Case of Extra-uterine Pregnancy, with Presentation of Specimen," by Dr. H. Tuholske, of St. Louis, Mo. This paper was read by Dr. Jonas, of St. Louis, in the absence of the author.

5. "The Surgical Treatment of Dysmenorrhœa," by Dr. Henry D. Fry, of Washington, D. C.

Discussed by Drs. McRae, Ricketts, Hardon, Johnston, Haggard, Vander Veer, and the discussion closed by the essayist.

6. "Repair of a Complete Laceration of the Perineum in a Girl of Nine Years, Produced by the Finger of the Obstetrician at the Patient's Birth," by Dr. H. A. Royster, of Raleigh, N. C.

7. "Aneurism of the Abdominal Aorta," by Dr. E. G. Williams, of Richmond, Va.

On motion, the Association adjourned until 9.30 A.M., Wednesday.

SECOND DAY.—*Wednesday, November* 13, 1901.

Morning Session.—The Association met at 9.30 A.M., with the President in the Chair.

8. "Closure of the Abdominal Incision," by Dr. I. S. Stone, of Washington, D. C.

Discussed by Drs. Hall, Noble (Charles P.), Bovée, Morris, Price, Ferguson, and the discussion closed by the essayist.

9. "My First Abdominal Section," by Dr. Thaddeus A. Reamy, of Cincinnati, Ohio.

Discussed by Drs. Lewis and Price, and the discussion closed by the essayist.

10. "Some of the Avoidable Causes for Disaster in Appendicitis Work," by Dr. Robert T. Morris, of New York, N. Y.

On motion of Dr. McRae, the discussion on this paper was postponed until after the delivery of the President's Address. At this juncture, the First Vice-President, Dr. George H. Noble,

took the Chair, and the President, Dr. Manning Simons, delivered his address.

On motion of Dr. W. E. B. Davis, a rising vote of thanks was extended to the President for his very able and scholarly address.

At the conclusion of the President's Address, the discussion on the paper of Dr. Morris was proceeded with. It was opened by Dr. Mixter, and continued by Drs. Ricketts, Vander Veer, Ferguson, and the discussion was closed by the author of the paper.

On motion, the Association adjourned until 2.30 P.M.

Afternoon Session.—The Association reassembled at 2.30 P.M. with Dr. Noble in the Chair.

11. "Results Obtained in Sixty Operations for Prostatic Hypertrophy; Demonstration of a New Cautery Incisor, etc.," by Dr. Hugh H. Young, of Baltimore, Md.

12. "Suprapubic Prostatectomy," by Dr. Floyd W. McRae, of Atlanta, Ga.

13. "Perineal Prostatectomy," by Dr. Alexander Hugh Ferguson, of Chicago, Ill.

These three papers were discussed jointly. The discussion was opened by Dr. Morris, and continued by Drs. Young and Jelks, the discussion being closed by the essayists.

The President appointed as an Auditing Committee, Drs. W. E. B. Davis, Joseph Taber Johnson, and I. L. Watkins.

14. "Gunshot Wounds of the Abdomen," by Dr. John C. Wysor, of Clifton Forge, Va.

15. "Foreign Bodies in the Œsophagus, with Report of Cases," by Dr. J. W. Long, of Salisbury, N. C.

Discussed by Dr. Wysor.

16. "Penetrating Wounds of the Abdomen, with Histories of Six Successful Laparotomies and Statistical Tables of One Hundred and Fifty-two Abdominal Sections done at Charity Hospital, in New Orleans, La.," by Dr. E. D. Fenner, of New Orleans, La., read by the Secretary.

On motion, the papers of Drs. Wysor and Fenner were discussed jointly. The discussion was opened by Dr. Brown, and continued by Dr. Rodman, Major Owens, and Simons.

On motion, the Association then adjourned until 9.30 A.M., Thursday.

THIRD DAY.—*Thursday, November* 14, 1901.

Morning Session.—The Association met at 9.30 A.M., with the President in the Chair.

17. "Two Cases of Nephro-ureterectomy," by Dr. J. Wesley Bovée, of Washington, D. C.

Discussed by Drs. Noble, Noble (Charles P.), Cathcart, Young, Ferguson, and the discussion closed by the essayist,

18. "Surgical Treatment of Procidentia Uteri," by Dr. Charles P. Noble, of Philadelphia, Pa.

Discussed by Drs. Bovée, Morris, Ferguson, Jelks, and the discussion closed by the essayist.

19. "Spiral Section of Fibroid Tumors in the Lower Portion of Uterus to Facilitate their Removal; Puncture Scissors and Counter-pressure Instrument for Vaginal Puncture in Vaginal Drainage; The Use of Adhesive Plaster for the Prevention of Laceration of the Perineum in Forceps Delivery," by Dr. George H. Noble, of Atlanta, Ga.

Discussed by Drs. Jelks, Hardon, Reamy, Talley, Leigh, and the discussion closed by the essayist.

20. "Report of a Case of Hepatotomy for Biliary Obstruction, with Remarks," by Dr. W. E. B. Davis, of Birmingham, Ala.

Discussed by Drs. Ricketts, Morris, McRae, Noble, Ferguson, Tiffany, and the discussion closed by the essayist.

The President stated that the Auditing Committee was ready to make its report, which was read by the Secretary, as follows:

"Your Auditing Committee desires to report that it has examined the books of the Secretary and Treasurer, and found them correct, as attested by the proper vouchers."

On motion of Dr. Talley, the report of the Auditing Committee was adopted.

The President stated that the next thing in order was the report of the Council, which was read by Dr. McMurtry, as follows:

REPORT OF THE COUNCIL.

The Council recommends the following applicants for membership:

Dr. H. J. Boldt, New York, N. Y.

Dr. X. O. Werder, Pittsburg, Pa.

Dr. Samuel J. Mixter, Boston, Mass.
Dr. Rufus E. Fort, Nashville, Tenn.
Dr. Robert W. Johnston, Baltimore, Md.
Dr. J. T. Runyan, Little Rock, Ark.
Dr. Lane Mullally, Charleston, S. C.
Dr. Mack Rogers, Birmingham, Ala.
Dr. James A. Dibrell, Little Rock, Ark.
Dr. Greer D. Baughman, Richmond, Va.
Dr. Charles M. Hazen, Richmond, Va.
Dr. Charles M. Rosser, Dallas, Texas.
Dr. Charles R. Robins, Richmond, Va.
Dr. A. J. Ochsner, Chicago, Ill.
Dr. Edwin Ricketts, Cincinnati, Ohio.

AMENDMENTS TO THE CONSTITUTION.

With reference to amendments to the Constitution, they do not affect in any way the organic law of the Association, but they are simply amendments made for the purpose of eliminating tautology and careless wording that have crept into the Constitution by republication from year to year in the TRANSACTIONS.

OFFICERS.

The Council recommends the following officers for the ensuing year:

President, Dr. W. E. B. Davis, Birmingham, Ala.; First Vice-President, Dr. J. Wesley Bovée, Washington, D. C.; Second Vice-President, Dr. J. W. Long, Salisbury, N. C.; Secretary, Dr. W. D. Haggard, Nashville, Tenn.; Treasurer, Dr. F. W. McRae, Atlanta, Ga.

The Council also recommends that the next meeting be held in Cincinnati, Ohio, and that Dr. Thaddeus A. Reamy act as Chairman of the Committee of Arrangements.

The Secretary announced that Dr. McMurtry was re-elected to membership on the Council, and desired that this be incorporated in the motion to adopt the recommendations of the Council.

Dr. McRae moved that the rules be suspended, and that the Secretary cast the unanimous vote of the Association for the adoption of the report of the Council as read. Seconded and carried.

Dr. McRae stated that, as Treasurer, he had received no notice of the honorarium which it is customary to pay the ex-Secretary and present Secretary. There was no report, although he knew that this matter had been passed upon.

The President stated that, without objection, this could be embodied in the report of the Council.

On motion, the Association adjourned until 2.30 P.M.

Afternoon Session.—The Association reassembled at 2.30 P.M., and was called to order by the President.

The retiring President appointed Drs. Jelks and Hardon to escort the newly-elected President to the platform.

Dr. Simons, in presenting Dr. Davis, the newly-elected President, said:

Fellows of the Southern Surgical and Gynecological Association: It is purely a matter of artificial form for me to introduce to you Dr. W. E. B. Davis, the newly-elected President of the Association. He is well known to all of you; he is well known to the profession of the whole country. He is loved by all of us for his personal attributes. We honor him for his professional attainments; and this Association owes to him a debt of gratitude, only a small proportion of which we can really pay by elevating him to the position of President of this Association. He was present and officiated at the birth of the Association in Birmingham in 1887. Since that time he has tenderly nursed it to its growth, until it has now attained lusty and vigorous manhood. He has been its firm friend and valued adviser. Therefore, I repeat, that it is only a small recognition of the value of his services to the Association by electing him President. It is a great pleasure for us to testify to the great appreciation we have of the value of his services to the Association. Dr. Davis, I commit to you the gavel of the Association, knowing that if you handle it with the consideration and with equal-handed justice that you exhibited in your services as Secretary of the Association for so many years, you cannot fail to do otherwise than to satisfy every individual member, no matter how exacting he may be. (Applause.)

Dr. Davis, in accepting the Presidency, said:

Fellows of the Southern Surgical and Gynecological Association: It is kind of our President to speak so highly of my work

in behalf of this Association. I feel extremely embarrassed after the compliments that have been paid me by our distinguished and scholarly President. I feel unworthy to fill the shoes of so able a man, one who has served us so well, and who has conducted the meeting without a ripple. It is unnecessary for me to tell you, gentlemen, that I highly and profoundly appreciate my election to this high office. As our retiring President very properly said in his address, there is no honor that can come to a Southern surgeon that is comparable with being elected to the Presidency of this Association. I fully understand that I have not been elected on account of my being worthy of the office, or on account of my ability in any sense, but because it was your wish to reward me for my faithfulness and services to the Association, and because of my love for the Association. It should be a source of great pride to the founders and other members of the Association to notice the great success that it has achieved. Its work has been a credit to American surgery. It has given the South a reputation throughout the world. While its name is Southern, and while its meetings have been held in the South, yet its membership is composed of men from all sections of our common country. It is sectional in name only, and I trust it may continue to be the Southern Surgical and Gynecological Association for all time, and that its name shall never be changed. (Applause.) I may say, that it has accomplished more than any other special association in this country in bringing together the best men from different sections of the United States. We have had exceptional opportunities of seeing the good work of the eminent men of our entire country. It has made us broader as surgeons and gynecologists. (Applause.)

If you will pardon me for digressing a moment, I will say it is my conviction that we have too many societies of a certain class. We should have a local society, a State society, and special societies for each section of the country, and the American Medical Association. It should be the aim of all special societies and local and State medical societies to make the American Medical Association the greatest Association in the world. (Applause.)

21. "Two Interesting Cases," by Dr. Joseph Taber Johnson, of Washington, D. C.

Discussed by Drs. Hardon, Mixter, Rodman, Long.

22. "Hodgen's Splint for Treatment of Fracture of the Thigh," by Dr. George S. Brown, of Birmingham, Ala.

Discussed by Drs. Rodman, Simons, Talley, Morris, McRae, Taylor, Roberts, and discussion closed by the essayist.

23. "Inguinal Hernia of the Ovary," by Dr. William P. Matthews, of Richmond, Va.

Discussed by Dr. Long.

24. "Loss of the Base of the Bladder, with a Plastic Operation; Ovarian Cyst in a Negress with Uterine Fibroid," by Dr. Southgate Leigh, of Norfolk, Va.

Discussed by Drs. Hardon, Brown, Long, Simons, Johnson, McRae, Johnston, and the discussion closed by the essayist.

Dr. Manning Simons: At the last meeting of the Association, held in Atlanta, when the announcement was made of the selection of Richmond as the place of meeting, there was a general expression of satisfaction and a feeling that the meeting would be a success. I rise to say, that I believe I am only voicing the sentiments of this Association at large, when I say that our realizations have far exceeded our expectations; that this meeting has been to us one of the most pleasant, if not the pleasantest, of the meetings of this Association, and I rise with a desire to offer a resolution expressing to the Committee of Arrangements our thanks for their thoughtful, careful, and thorough preparation for this meeting, and to express to the profession at large of Richmond and the citizens of this city our high and warm appreciation for their cordial welcome and unstinted hospitality on this occasion.

On motion of Dr. Rosser, the resolution of thanks was unanimously adopted.

Dr. Joseph Taber Johnson moved that a vote of thanks be extended to the retiring President for having so ably presided over the deliberations of the Association. Carried.

The following papers were read by title:

"Puerperal Septicæmia," by Dr. Wm. R. Pryor, of New York, N. Y.

"Pelvic Hæmatocele and Hæmatoma," by Dr. Walter P. Manton, of Detroit, Mich.

"Retrodisplacement of the Pregnant Uterus; its Surgical Treatment," by Dr. Wm. A. Quinn, of Henderson, Ky.

"Surgical Treatment of Dysmenorrhœa in Unmarried Women and Girls," by Dr. John T. Wilson, of Sherman, Texas.

"Tuberculosis of the Female Generative Organs," by Dr. John B. Murphy, of Chicago, Ill,

"Cancer of the Female Urethra, with Report of Cases," by Dr. C. Jeff. Miller, of New Orleans, La.

"The Angiotribe; its Use and Abuse," by Dr. James N. Ellis, of Atlanta, Ga.

"Some Points in the Treatment of Appendicitis," by Dr. A. M. Cartledge, of Louisville, Ky.

"Gunshot Wounds of the Abdomen," by Dr. Wallace Neff, of Washington, D. C.

"Report of a Case of Gangrene of the Gall Bladder," by Dr. George Ben Johnston, of Richmond, Va.

"Report of Cases of Gall Stones," by Dr. James A. Goggans, of Alexander City, Ala.

"Gastrostomy in the Treatment of Impermeable Stricture of the Œsophagus," by Dr. Hugh M. Taylor, of Richmond, Va.

"Some Cases of Ureteral Stricture," by Dr. Howard A. Kelly, of Baltimore, Md.

"Clinical Report of Two Cases of Osteosarcoma of the Inferior Maxillary Treated by Excision, with Statement of Condition of Patients after One Year," by Dr. Hermann B. Gessner, of New Orleans, La.

"Cases of Tumor of the Inferior Maxillary," by Dr. Willis F. Westmoreland, of Atlanta, Ga.

"Hepatic Drainage," by Dr. John B. Deaver, of Philadelphia, Pa.

"Intestinal Perforation in Typhoid Fever," by Dr. M. C. McGannon, of Nashville, Tenn.

"Report of a Peculiar Succession of Septic Wounds," by Dr. A. J. Coley, of Alexander City, Ala.

"Pott's Disease and some of its Complications," by Dr. A. R. Shands, of Washington, D. C.

"Chronic Rectal Prolapsus Treated by Traction through Abdominal Incision under Spinal Analgesia," by Dr. F. W. Parham, of New Orleans, La.

"Osteotomy for Genu Valgum, with Report of Five Cases," by Dr. E. Denegre Martin, of New Orleans, La.

"Thirty-five Mastoid Operations," by Dr. J. M. Crawford, of Atlanta, Ga.

"Myomectomy in the Gravid Uterus," by Dr. R. E. Fort, of Nashville, Tenn.

"Surgery of the Pancreas," by Dr. W. D. Haggard, of Nashville, Tenn.

There being no further business to come before the meeting, the Association, on motion, then adjourned, to meet in Cincinnati, Ohio, on the second Tuesday in November, 1902.

W. D. HAGGARD,
Secretary.

NOTE.

The Association does not hold itself responsible for the views enunciated in the papers and discussions published in this volume.

W. D. HAGGARD, M.D., *Secretary*,
NASHVILLE, TENN.

ANNUAL ADDRESS OF THE PRESIDENT.

By Manning Simons, M.D.,
Charleston, S. C.

I CONGRATULATE you on having the privilege of meeting together again after the lapse of another year, with its many changes. It is indeed a pleasure to renew the friendships engendered by our meetings, and it is a great gratification to me to welcome you officially to the fourteenth annual assemblage.

I regret that my congratulations must be followed by the announcement of the great loss which we have sustained since our last meeting. On reassembling we are pained to find vacant the places of two of our Fellows—Dr. W. D. Haggard and Dr. Hunter McGuire, two of the founders of this Association; the former its first, the latter its second President. Eminent in their profession, honorable and upright in their private lives, their death is an irreparable loss not only to us, not only to the communities in which they lived, but to the profession which labors for the advancement of that branch of knowledge that has for its object the relief of human suffering.

> "The night dews that fall, tho' in silence they weep,
> Shall brighten with verdure the graves where they sleep;
> And the tears which we shed, tho' in secret they roll,
> Shall long keep their memories green in our soul."

I make the announcement of their death with the assurance that the Association will take appropriate action to honor the memories of those distinguished men.

They lived and moved among us, and their presence was

a social and professional enjoyment. We honored them in the past by elevating them to the highest office in our gift; we honor them now by recalling their virtues and achievements.

To preside over the meetings of the Association has been to my predecessors, and is to me, an unalloyed pleasure. To the President the function "to see that the rules of order and decorum be properly enforced in all deliberations" has been the easiest of his duties.

A careful search of our TRANSACTIONS since the origin of the Association fails to find any questions of ethics or personal controversies, unfortunately so common in medical organizations. The expression so common among the laity "that doctors will differ" finds no confirmation, at least in the personal relations of its members.

The mutual enthusiasm to promote its welfare, and the consequent subjection of individual interests to the common good, have constituted the unwritten code that has regulated all our sessions.

A single selfish feeling intrudes itself here—the pride felt in the position to which your partiality has called me. The honor merits and receives my most grateful acknowledgments.

The only difficult duty of the President is prescribed in the article of the By-Laws requiring him to "deliver an annual address at each meeting of the Association." The performance of the duty is left to him—how to evolve from his innermost consciousness what a presidential address ought to be. My predecessors have covered almost every imaginable subject in their excellent addresses, and I find myself embarrassed to know how to meet my obligations in this respect. It seems to me, however, at the end of fourteen years of the life of this Association, pertinent to inquire whether its existence has been justified by the results of its work?

The doubts and difficulties surrounding the inception of this Association in 1887 have been most graphically described by Dr. Bedford Brown in his admirable and interesting address at its sixth session in New Orleans in 1893. This

address made so great an impression upon the Association that by resolution the Publication Committee was instructed to provide five hundred copies in pamphlet form for distribution among the members and the author's friends. This distinguished Fellow of the Association lived to see these doubts dispelled.

The Association has grown and rapidly developed to its present proportions. It has exercised a great influence on surgery in our part of the country.

When we review the state of affairs existing in the Southern States at the end of the Civil War the doubts expressed by the author of the address referred to as to the success of a special scientific association were most natural and reasonable.

In the present onward movement, and amidst the bright prospects of our Southland as they exist to-day, few of us pause to make a retrospect of the educational status of twenty or thirty years ago. Certainly the present generation has no conception of the difficulties that have been surmounted and the trials that were undergone by their predecessors in the rehabilitation of our educational institutions, both medical and literary.

We can scarcely realize now that for four years from 1860 to 1865, inclusive, our educational institutions were deserted and closed. Years of valuable time were lost, and our people found themselves in 1865 five years behind the world in mental culture. The world of letters was closed to us, and new books and new ideas developed in the rest of the civilized world reached us only after they had been digested and assimilated by educated and cultivated people elsewhere. The work of progress in medicine, except such as belongs to military surgery, was as a sealed book to those who resumed civil practice, and years of hard work were necessary to bring us abreast with the rest of the medical world.

From 1865 followed years of educational chaos, when the wheels of civil institutions were blocked and the institutions and customs of the old regime were overturned. Meanwhile

the earnest cry for higher education went up everywhere, and competitive examinations were the standard by which seekers for employment were measured.

All this has been changed. In looking back it seems as if it were changed by magic rather than by the slow process of united energy, determination, and industry.

The history of our medical colleges in the South testifies to the energy, determination, and industry of those by whom they were originated, maintained, and conducted.

Few of our colleges are endowed, and their success depends upon their trustees, faculties, and students; yet to-day the South can well be proud of her medical institutions.

Their present standing is due, in great part, to the increased educational facilities of the country. But a few years have passed since students who presented themselves for matriculation had to be subjected to a preliminary examination, to ascertain if they possessed sufficient education to justify their acceptance as students of one of the learned professions. To-day they present themselves with college or university diplomas as a foundation upon which to build their medical instruction.

From year to year the demand has been made for a higher standard of medical education. The two-years' course was regarded as insufficient training for a degree. The Southern colleges promptly met the demand, and a three-years' course was universally adopted. Again the four-years' course was deemed necessary by the colleges at the metropolitan centres, and the Southern colleges promptly met this demand. At this time the colleges of the South are holding their position with the foremost of this country.

Doubtless these advances in the standard of medical education are due in a great degree to the medical societies in the various States. This Association has contributed largely to the elevated standard in the South by the stimulus it has given to ambition in individual members of the profession.

The design of this Association has been not only to advance

surgery and gynecology in the South, but to establish a school of instruction for at least two classes of members provided for by its originators.

The laws of the Association were so arranged as to embrace three distinct classes of professional men : First, the specialist, whether surgeon or gynecologist, of distinction, skill, and experience ; second, the general practitioner of eminence and experience, who, in addition, practised surgery and gynecology to a limited extent ; third, the rising young surgeon and gynecologist of character, talent, education, and promise, but whose practical experience was limited.

This wise provision has stimulated the study of surgery and gynecology in the South to such an extent that the two last-named classes of members have diminished in numbers yearly, until this Association may truly be regarded as composed almost entirely of specialists, whose work entitles them honestly and justly to be so styled.

Having to a great extent overcome the difficulties of the problem of its existence, this Association has triumphed over sectional prejudice and unpatriotic jealousies. It has become as national in its character as the American Medical Association, and extends the right hand of fellowship to our professional brethren in every part of the country.

We have the honor to number in our fellowship distinguished men from the North, East, and West, as well as the South, who have joined with us in building up this Association, of which they are a welcome and integral part.

This Association for the past fourteen years has been steadily making the surgical history of the South, and in no small part that of this country.

A review of its TRANSACTIONS, constituting a surgical library in themselves, would repay one who has already read them or heard the papers at their original presentation. The history of surgical progress and improvement during these fourteen years can readily be traced in these volumes.

The reader can see the narrow pathways of original investigation and work, blazed out by the pioneers and leaders,

widen into the broad highways of surgical practice now open for daily use.

We number among the Fellows of this Association some of the distinguished masters of surgery and gynecology—teachers and operators, originators and investigators—whose names and work are familiar wherever enlightened surgery is practised.

Can it not truly be said that after the short term of fourteen years this Association has justified its existence, and that it is a living monument to its founders, who, by their ability, learning, and professional attainments, contributed to its present vigorous life?

Medical societies and associations are the natural outcome of the development of the science and art of medicine and surgery, and for this reason they have multiplied in recent years to fulfil the purpose of discussing "propositions bearing on the promotion of more systematic observation and plans of operation, and of greater uniformity in the mode of publishing results, as well as for the consideration of matters on which the co-operation of corresponding societies is desired." To the wonderful development of medicine and surgery during the nineteenth century may be traced the increase of such organizations.

Private scientific societies have originated chiefly during the past century, the demand for their existence being due to the necessity of increased organization of rapidly developing knowledge and the desire among workers for a common ground to meet, discuss, and compare results and collect facts for future generalization.

The natural tendency of such societies is to become more and more specialized, to keep pace with the specialties into which medicine and surgery are daily being subdivided.

The benefits to the medical profession derived from these societies have been very great and their good influences far reaching.

There has been a general demand for specialism in every department of life in recent years, and in medicine and sur-

gery particularly has this demand been evident both in the profession and among the laity. Patients now demand and require special treatment of their ailments, and this requirement has been met by the division of medicine and surgery into many departments. As is usual in the development of a new idea, there is a tendency to go into extremes, and we now find even the recognized specialties undergoing subdivision in accordance with the trend of individual inclination.

It is probably admitted that general knowledge is the aggregate of special knowledge; but, conversely, individual special knowledge is attained at the expense of general information. If this be granted it seems possible that the legitimate ends of specialism may be diverted into narrow-mindedness and one-sidedness. It is more than probable that the greatest advance in recent years in specialism in surgery has been in the direction of perfecting technique and cultivating manual dexterity.

It is true that we have availed ourselves of the aids derived from the progress made in the collateral work of the bacteriologist and pathologist, but there seems to be a growing belief in some quarters that clinical observation is being somewhat neglected in our efforts to attain perfect technique.

Accurate diagnosis naturally forms the basis upon which successful operative work must rest, and it must be admitted that skilful diagnosis depends upon extensive general knowledge. It is impossible to disregard the interdependence of the various systems of the human economy.

Thought habitually concentrated upon one system must naturally influence our judicious and correct interpretation of phenomena relating to the whole. There is a growing tendency to neglect the ordinary methods of diagnosis for the more brilliant resources of exploratory incisions and operations, often of considerable magnitude, simply for diagnostic purposes.

In these days of enlightened surgery few will question the justifiable resort to exploratory operations with diagnostic object, nor will the doubt be raised that such operations, in

the hands of skilled and experienced operators, under aseptic wound conditions, are comparatively free from danger; still it must be recognized that this short cut to knowledge is not conducive to the development of the higher art of diagnosis by exclusion, which under existing surgical custom bids fair to become a lost art.

Acuteness in diagnosis is the result of general learning and familiarity with all the elements conducive to a true appreciation of symptomatology and pathology.

It is true that some men seem to possess intuitively diagnostic art, but the safest diagnostician is he who arrives at his conclusions by process of reasoning rather than by a short cut.

The chairman of the Section of Practice of Medicine of the American Medical Association, at its last meeting, has expressed somewhat this idea in these words:

"Neither the physician nor the surgeon can afford to confine himself alone to his special studies. Without wishing to detract from the merits of our surgical confrères, the medical practitioner is compelled to witness or learn of surgical operations having been performed which would most probably not have been performed had the operator first consulted with a progressive clinician. Conversely, the physician would grow less conservative as the result of more frequent consultations between himself and surgeons—a consummation to be desired."

Correct technique and deft manipulation are the common property of the surgeons of to-day. The brilliant results of modern surgery have to a great extent overshadowed the disasters that occasionally occur, and the people have become educated to accept surgical operations when proposed, even though they be of the greatest magnitude.

There is scarcely a cross-roads—the whole establishment of which consists of a blacksmith-shop, saw-mill, and grist-mill—which has not a surgeon who is conversant with a correct knowledge of modern technique, and who possesses manual dexterity with the self-confidence and boldness that enable him to do most of the operations of surgery.

One is impressed with the truth of this statement by the discussion on the paper of Dr. Deaver on "Appendicitis," read at the last meeting of the American Medical Association.

A member from Anaconda, Montana, said: "In Montana it is impossible to get Dr. Deaver or any other noted surgeon out there; it is impossible to do anything but take right hold of these cases yourself, and I promise you we do it. We find no difficulty in performing operations for appendicitis, but we *do* find difficulty in treating them on medical lines."

Technique and manual skill are indispensable attributes of the surgeon, but the danger of the day is their cultivation to the neglect of the knowledge of their proper and judicious application. The standard of excellence of the surgeon does not consist alone in his operative skill, but in his diagnostic acumen, his judgment in the determining of operative and non-operative cases, and his ability to correctly measure the limitations of justifiable surgery. Seven operations performed on the same patient at one sitting indicate the overshadowing of diagnostic acumen by the boldness, skill, and correct technique of the operator and his unbounded confidence in the powers of nature to withstand so shocking a procedure.

The glamour of brilliant surgical results has fired the ambition to operate, and many aspirants enter the field of surgery who borrow their equipment from their better prepared confrères.

There is no more danger to the community from the injudicious and unlearned administration of calomel and castor oil and in "meddlesome midwifery" than lurks in the "aseptic scalpel" in the hands of the surgeon.

It has been said "there could be no art of healing until the earth was full of graves;" "it is by shipwrecks that we learn to build ships."

It is true some surgeons are "born, not made;" but the problems of modern surgery demand more than manual dexterity or inspired knowledge. Four years' lectures and six

months' post-graduate course cannot be regarded as preparation adequate to justify the position of specialist in surgery.

The present too common custom for a graduate in medicine to select a specialty and establish himself as a specialist does not meet the requirements of specialism of to-day. Hospital experience and a general practice of five or ten years should be a prerequisite for affiliation with special societies. State examinations are required of all graduates in most of the States before they are granted licenses to practice as general practitioners. Surely there should be some provision of a like kind for special examinations to determine the qualifications of those who desire to enter upon the practice of a specialty, and particularly that of surgery and gynecology.

In these days of materialism it would seem out of season to speak of the sentimental aspect of medicine, but medicine has certainly had its sentimental side.

The times have changed, and we have changed with the times. The demands of modern medicine have to a large extent divested the practice of the sentiment that formerly surrounded it. It is a question to what degree specialism has led us into the paths and methods of ordinary business.

The relations of the patient to the doctor and those of the doctor to the patient have certainly changed in conformity to the modernized methods of practice.

Gratitude, respect, and confidence do not express adequately the sentiments of patients to their physicians in the olden times. Their loyalty was as marked as their love of country, and their confidence as immovable as their faith in their religion.

A patient having selected a physician recognized in him the one individual to whom he confided as much as possible the care of himself and family.

The people, however, of the present time have been educated to appreciate the utility of and necessity for specialism in medicine and surgery, and each individual has his separate doctor for his eyes, his ears, his nose, his throat, and, indeed, for every system of the economy, to whom he goes from one

to the other as he does to his butcher, his baker, and his candlestick maker.

Under these changed circumstances the relations of the doctor to the patient have in like manner, in accordance with the demands of the times, undergone a radical change.

Formerly calls made on him by his patients were binding, even at the risk of his life, health, comfort, and convenience. Now the obligations that formerly devolved upon him among his clientele are shared by many others. The feeling that this changed relation is entertained by the public is most graphically portrayed by Ian MacLaren in his pathetic description of William MacLure, a doctor of the old school. His description of "through the flood" of Dr. MacLure and Sir George, the great metropolitan specialist, to the bedside of Annie Mitchell, plainly points out the self-sacrificing devotion of the doctor of the old school. "Sir George was as brave as most men, but he had never forded a Highland river in flood, and the mass of black water racing past, beneath, before, behind him, affected his imagination and shook his nerves. He rose from his seat and ordered MacLure to turn back, declaring that he would be condemned utterly and eternally if he allowed himself to be drowned for any person."

"Sit ye doon!" thundered MacLure; "condemned ye will be suner or later, gin ye shirk yir duty, but thro' the waters ye gang the day."

After a brilliant and successful operation, when Dr. MacLure placed the precious bag of instruments beside Sir George he laid a check along with it and was about to leave. "No, no," said the great man; "you have some right to call me a coward, but I will never let you count me a mean, miserly rascal," and the check fell in fifty pieces to the floor. Thus we see portrayed, in this pathetic story, the contrast of the duty of the doctor of the old school with the charity of modernized medicine.

The contrast is probably harshly and somewhat unjustly drawn by the writer of the beautiful story of a doctor of the

"old school," but it points to a possible danger into which the specialism of to-day may be leading us. This brings me to speak of the passing of the "family doctor." Little by little he is being shorn of his glory and usefulness. Doubtless he has been one of the most picturesque figures in society, about whom have clustered many recollections of kindliness, charity, gentleness, and unselfish devotion to duty and appreciation of the greatness of his mission.

As the great oak that has withstood the vicissitudes of tempests for ages yields to the demands of rapid transit, and landmarks around which historic recollections cluster give way to the necessities of modern improvement, so the "family doctor" of the old school is gradually yielding before the rapid advance of the continued development and improvement in the methods of medicine and surgery.

The history of Dr. William MacLure by Ian MacLaren; the noble life of the typical Virginia gentleman, Dr. Carey, as portrayed by Thomas Nelson Page; and Dr. Sevier, described by Cable in these few words: "He stood straight up in his austere puremindedness; his inner heart was all flesh, but his demands for the rectitude of mankind pointed out like the muzzle of cannon through the embrasure of his virtues"—constitute fitting eulogies on the character and usefulness of the old-time "family doctor."

In parting with him we may use the words of Sir George to MacLure: "Give 's another shake of the hand, MacLure! I'm proud to have met you; you are an ornament to our profession."

In conclusion, I desire to express my appreciation of the honor you have conferred upon me in having elevated me to the office of President of this Association. I feel that it is the highest reward that can be conferred upon a Southern surgeon.

VAGINAL PUNCTURE OR INCISIONS FOR PURIFORM DISEASE OR EXPLORATORY PURPOSES ARE UNSURGICAL PROCEDURES.

By Joseph Price, M.D.,
Philadelphia, Pa.

I daily hear of vaginal punctures or incisions, or abdominal sections at two or more points, to determine the precise nature of intrapelvic or abdominal disease. Such operations to establish a diagnosis are unnecessary, and a more prolonged apprenticeship in a good clinic would give the men who do them a better working knowledge of the natural history and diagnosis of intrapelvic and abdominal disease. At present our knowledge of the numerous pathological conditions found there is so perfect that there is no excuse for multiple incisions. Only a few days ago in an educational centre a group of three or four surgeons opened the abdomen of a child at two points to remove a kidney. Such mutilation should be unsparingly condemned.

I am here to present and discuss this subject not because I prefer suprapubic operations. You are all familiar with the results of an ideal and complete suprapubic procedure, but I have been asked so often in the last year to see and re-operate on patients upon whom vaginal incision or puncture methods have been practised that I cannot but believe that such methods are radically wrong. Summer resorts have been full of such patients, and in not a single instance has the relief been more than temporary; some of the incisions have evacuated pus or something else; some have incised structures not pathologically involved.

In three very recent operations for removal of pelvic contents, puncture and vaginal incision complicated sections that would have been very easy. Vaginal fixation, closure of the openings, and refilling of puriform or serous sacs are local complications; and the general condition of the patient becomes rapidly unfavorable for good abdominal work. I am satisfied that the ancient methods of evacuating puriform accumulations, that of cautery or caustics, was much more scientific than the present method of incision. Operators practising incision methods never know the precise pathological conditions. They puncture or incise a puriform accumulation and guess at a name: ovarian abscess, pus-tube, or pelvic abscess. If the fluid evacuated is serous in nature they call it encysted serous effusion; the probabilities are that it is a dropsy of the tube or hydrosalpinx. Puriform tubes as large and tortuous as one's flexed thumb should never be overlooked or punctured. The error of puncturing an ovarian abscess or small dermoid, two conditions very commonly found, and both easily enucleated, should never be made. I have never known a patient cured by the methods referred to.

The general condition of patients, the rapid restoration to health following clean extirpations, from either *above* or *below*, are striking when compared with the patients travelling around seeking relief and health after the timid, incomplete procedures under discussion. They are sadly disappointed, have lost their courage and confidence; they have had an operation, and paid for it; have visited summer and winter resorts and sought additional counsel, and been told that more operative interference will be necessary. I have been asked to see two patients in the last few days, both have had vaginal incisions without the slightest relief; both have paid well for the service; both have formed the opium habit, and both are now unfavorable subjects for complete surgical interference. Hereafter I would strongly urge all of you to carefully compare the three groups of patients—you will see them in good numbers. The first from men practising sections and clean removal of all pathological conditions, freeing and repairing all disorganized viscera.

The second from the vaginal operator, who extirpates everything, but does not free or repair overlying bowel and omentum, or complete an ideal operation, overlooks the diseased and adherent appendix and numerous complications found and corrected in the suprapubic method. In the third group the patients come to you with the history of being in a hospital and having had an operation, an abscess opened, that the abscess is refilling or forming again, that the drainage has ceased, that they have their old pain again, that they are losing their strength, neither sleeping nor eating, freely exhibiting their emaciated extremities, and "Doctor, I am wasting away to nothing!" It pains me to see such a patient come into my office; they commonly stop on their way to and from the shore, going East or South to a summer or winter resort. I am always reminded when I see such a patient of a statement I made to my good friend McMurtry only a few years ago: "Mac, pelvic surgery as we do it will be a lost art." I did not expect when I made the statement to live to see it. The results of the work throughout the country of good, painstaking suprapubic operators are fine and pleasing, with a very low mortality. The results of a number of good operators practising complete extirpations by the vaginal route, such as Pryor, Jacobs, and Segond, are also pleasing, but are not complete, and are followed by a large number of post-operative accidents and sequelæ. The puncture and incision methods were practised by Hippocrates and his pupils B.C. 410. But they were then done by caustics, and so were more scientific than the puncture methods practised to-day.

DISCUSSION.

Dr. George H. Noble, of Atlanta, Ga.—I have been very much interested in the paper of Dr. Price. For a long time it has been my practice not to open the vagina in treating the class of cases under discussion. I have not done a vaginal hysterectomy for the last six or seven years, but have operated from above, because I can see what is being done, and as an illustra-

tion I will state that in addition to four cases of abscess of the uterus reported at the St. Louis meeting, I have since encountered four more. All of them recovered. One had been treated by vaginal puncture and drainage, and was apparently hopeless. This patient suffered from septic infection for six weeks, and the septic process went steadily on. When the abdomen was opened I found the appendages on both sides full of pus and two large mural abscesses on either side of the uterus below the Fallopian tubes. I found an abscess on top of the bladder covered by omentum and abdominal wall, and another retention abscess formed about the coils of intestines. There was agglutination of the intestines until the mass seemed to be solid up above the umbilicus. In that case the same measures were adopted in the others. I removed the appendages, scraped out the abscesses, cauterized with carbolic acid, and then drained through the vagina and abdomen. The pelvic cavity may be drained through the vagina satisfactorily, but accumulations of septic material in the abdominal cavity above the pelvic brim cannot be drained satisfactorily by that route. These cases recovered, and I mention them only as an illustration of the fact that we find cases which we think amenable to vaginal puncture, but upon abdominal section find complicated states of affairs that are often astonishing.

About a year ago I had a case of large tubercular abscess of the ovary that looked very favorable for vaginal puncture and drainage, but concluded to go in through the abdomen, and found it was the best course I could have pursued, on account of the complications and involvement of the mesentery and the difficulty that would have been encountered in reaching the abscess from below. Great care was necessary to prevent serious injury to the mesenteric vessels in enucleation of the abscess. Per vaginam it would have been impossible without fatal results, or if it had been punctured for drainage, the tuberculous feature most likely would have passed unnoticed. Yet we must occasionally open large abscesses per vaginam—*i. e.*, where the patient is in such an extremely debilitated condition she cannot stand an abdominal section or perhaps an anæsthetic. However, we should look upon such proceedings as temporary measures. Let us suppose that Dr. Price had a woman with an abscess that contained two or three pints of pus, and her pulse was very

rapid and feeble, say 160 or 165, with a temperature of 105.5°, ranging at that point for a number of days, with clammy perspiration, would it not be safer to puncture such an abscess by the vagina, and subsequently go into the abdomen from above?

Dr. Price.—Of course, all of us would exercise our judgment in saving life. In such an extreme condition we should strive to bridge the patient over, and I think it would not be safe or good surgery to subject a case of that kind to an abdominal section.

Dr. Rufus B. Hall, of Cincinnati, Ohio.—I practice vaginal puncture and drainage only in those desperate cases referred to by the last speaker (Dr. Noble). I have done it in three or four, probably half a dozen cases, every year, and I have done it for quite a number of years. I have no apology to make for pursuing such a course. I believe I am right in so doing. Let us take such a case as has been cited by Dr. Noble, and the woman would die within twenty-four hours if an abdominal section were made by any living man; and yet her chances would be favorable for recovery if vaginal puncture and drainage were done as a temporary procedure. We would put such a woman in a position to make an abdominal section later for the purpose of curing her. I have always emphasized the fact to the patient and her friends that this operation through the vagina was not done for curative purposes, but only as a makeshift. It was only done to put her in a condition to undergo an abdominal section later, and it has been my experience that the vast majority of women, when the matter has been put to them in this straightforward way, will readily consent to have an operation made subsequently for permanent relief. A large number of such women have come back to me or have gone to someone else to have these operations done, even though they have declined them temporarily, and they must have them done in order to effect a permanent cure.

Dr. W. D. Haggard, Jr., of Nashville, Tenn.—I suppose the American medical profession is more indebted to Dr. Price than to any other living man for his wonderful work in treating pus in the pelvis through abdominal incision. His demonstrations at his private hospital have been witnessed by a great many physicians from time to time during the last ten or fifteen years, and many of us have received impressions that have be-

come fixed, convincing, and satisfying in practice. In old and long-standing cases such as were described by Dr. Noble the abscesses look as though they were going to point and rupture into the vagina. While we are aware that nature makes an effort to cure these cases in that manner—does so in some instances—we also recognize that, as a rule, it is unsatisfactory. Many of us have seen and known of cases that have been relieved in that manner, but many are not. Nobody would champion that method of cure, and very few of us are disposed to believe that nature could cure any considerable proportion of them. I would call attention, however, to the adequate evacuation of large abscesses by *incision* through the vagina—not *puncture*. I have had occasion to resort to this method a number of times. The mortality has been nil and the ultimate results very pleasing. Most of the patients got absolutely and completely well, some of them conceiving afterward. The abscess was enormous in one case. I fully expected in that instance to do an abdominal section for the purpose of removing the diseased tube and ovary afterward, but apparently the disease had expended itself. Suppuration extended from the tube into the peritoneum, had become walled off by adhesions, so that practically it was extraperitoneal. In this case the abscess was bulging into the vagina, and it was the easiest possible thing to do incision through the posterior fornix and drainage by a rubber tube. This young woman got entirely well, and never had a pain or an ache afterward. She subsequently bore a child. I think cases of that type demand the infrapubic route. This woman could not bear much surgery.

I am satisfied that post-operative peritonitis results in death in at least 10 per cent. of pus cases treated by abdominal section in the hands of any ten surgeons. The lesser objections are the likelihood of wound infection, the possibility of hernia, the presence of scar. The danger of injury to the viscera is greater where enucleation is practised from above than where simple evacuation below is done. But where ablation is performed below, the danger of visceral injury about equals that of the suprapubic route. It is much wiser to operate through the abdomen if there is not much pus.

We are pretty well agreed that we can evacuate pus through the vagina, and the subsequent operation through the abdomen

without the presence of pus is simpler and attended with less danger of infection. To be sure, in many of these cases the pus is sterile, but we can never tell beforehand, and we know that with all the care we exercise in dealing with pus through abdominal incision the operation is not devoid of danger.

We are under obligations to Dr. Price for reviewing the results of abdominal work, but I believe he will agree with the idea that in desperate cases of large abscess pointing in the vagina, as a temporary and life-saving measure at least, vaginal incision and drainage has a certain range of usefulness.

Dr. Lewis S. McMurtry, of Louisville, Ky.—The subject of suppurative pelvic inflammation is one of such enormous extent, and the disease presents itself in such multifarious varieties, that there is danger in a discussion like this of men talking of different conditions and of conveying impressions to others that they do not really mean. But, Mr. Chairman, I cannot help but recall to the Fellows of the Association what a wonderful change in professional opinion has obtained during late years in regard to the operative treatment of pus in the pelvis in women. You will remember that within a decade the Péan-Richelot-Segond operation was presented to the profession in this country personally by Jacobs and Segond, with the co-operation of Dr. Henrotin, of Chicago, and a very deep impression was made upon the minds of professional men in this country. The French surgeons deal with the pelvic organs just as the Woman's Hospital School of Gynecology in New York in cases of pus in the pelvis—that is, those surgeons have a mental picture of the disease from below. Five years ago, when vaginal surgery was so strongly urged upon the profession in this country, the representatives of that school of surgery which was organized and projected by Mr. Lawson Tait were made to appear non-progressive and behind the times. It seemed as though modern pelvic surgery, after the school of Mr. Tait, might become a lost art. I made a visit to Paris especially to see the work done there. I found Richelot and Segond and Péan doing vaginal hysterectomy for pelvic suppurative disease with a skill that was brilliant. The patient was prepared, the operator would sit on a stool between the legs of the patient, and remove the uterus, an operative procedure not occupying over fifteen minutes. No suturing; no irrigation. Through the

courtesy of Dr. Segond I had the privilege of seeing these cases in their convalescence. I saw the gauze removed on the third or fourth day, great quantities of it, which was offensive and discolored. These patients were not always cured. They recovered from the operation, but bowel adhesions were left behind. The sequestrum, which was the focal point of the suppurative process, was still in the pelvis; convalescence was not afebrile from these operations in the hands of the masters. That procedure was accepted in this country, and it became fashionable. The operation was extended by one of the ablest American gynecologists to include ruptured ectopic pregnancy, exploratory procedures, etc.

The method advocated this morning, which has been practised so brilliantly in this country by Dr. Price, has now been adopted in France, in Germany, and adopted generally by the enthusiastic advocates of the vaginal operation in this country. They had to adopt it because their patients did not recover after vaginal operations. It is not because of any sentiment or desire that a man changes his methods, but he is usually driven to it, for the reason that his patients do not recover. I refer the Fellows to a recent number of the *New York Medical Record*, in which will be found an article written by a young New England doctor who has made a tour of the European hospitals. The title of his paper is "The Best Place for Post-graduate Study in Europe." You will find it stated in that article that in France, Germany, and Austria the suprapubic method of abdominal section is now being adopted in preference to the vaginal method for approaching the pelvic structures in cases of suppurative diseases.

Of course, as I have said in my first sentence, suppurative pelvic inflammation presents such a variety of clinical pictures that we cannot lay down any hard-and-fast rules as to what patients should have a complete operation and those that should have a simple vaginal puncture made. There is a class of cases in which it is the duty of the surgeon to do absolutely nothing—that is, refuse to operate, because the patient will die anyway. I say that advisedly. When we have a patient in the condition described by Dr. Noble, one who is dying, it is the duty of the surgeon not to operate, because he will not rescue that patient. The patient cannot bear anæsthesia, and will die in a few hours; and if one does the operation he will lose other lives that might be saved but for the influence of that case. But when we come

to our daily regular work, and cases present themselves with suppurative pelvic inflammation, if we open the abdomen and treat them as we would a case of appendicitis, remove the pathological débris and deal with them in a direct way, we become at once masters of the situation. Let us take Dr. Noble's case of tubercular abscess of the ovary. How would we have ever known he was dealing with a tubercular process if he had resorted to vaginal incision and drainage? He never would have known that his diagnosis in that case was complete. As it is, he is glad that he resorted to thorough surgery through the abdomen.

I have a young woman in my private hospital now who has had an extensive suppurative pelvic inflammation and an abscess opening on the left side near the trochanter, through which was discharged grape-seeds, tomato-seeds, and other evidences of intestinal obstruction. By means of an abdominal operation a large tubo-ovarian abscess was enucleated, the opening in the bowel repaired, and the woman is getting well.

The time has arrived when the entire professional world has accepted almost entirely what Dr. Price has been contending for through years in this and other societies—namely, that thorough surgery can only be accomplished by attacking disease of the pelvic organs through a suprapubic incision.

Dr. Edwin Ricketts, of Cincinnati.—I am very glad that this subject has been brought before the Association for consideration from the stand-point of my friend, Dr. Price. I have had the handling of these cases from start to finish, and if I were asked the question of how best to deal with this class of cases I should unhesitatingly say I would do so through an abdominal incision. Unfortunately for us, we do not see all of these cases early enough. We see them late, after complications have occurred and when abdominal operations are *attended with greater danger.*

I saw a woman in 1886 who, after her first delivery, had a pelvic inflammation which was very severe. At the time I was called in consultation to see her I did not feel equal to the occasion from an abdominal stand-point, and, strange as it may seem to the essayist, a vaginal incision was made and drainage effected, and after due time the patient's health was restored. Unfortunately, I made a statement in her presence that the chances were

against her in regard to any future pregnancy. She was delivered of her fifth child a little less than a year ago, and as I attended her I was gently reminded of what I had said to her in 1886. Every case is a law unto itself. The assertion made by Dr. Price is too sweeping, for there are cases in which by vaginal incision or puncture and drainage these patients unload themselves and are in a better condition to undergo an abdominal section subsequently. I have no doubt that some cases are completely cured after vaginal incision and drainage. In Cincinnati we have had quite varied experiences in the hands of Dr. Zinke, and other operators I could mention; many of the patients having been seen by these gentlemen were considered late cases, yet they have been unloaded of their sepsis by vaginal incision and drainage. Those cases which do not recover following vaginal puncture and drainage are not complete operations, and later the abdomen should be opened and the diseased appendages removed.

It is by papers and discussions of this kind that we arrive at the truth. It must be admitted, however, that in a certain percentage of cases we must resort to vaginal puncture, but the majority of them are best handled through an abdominal incision.

Dr. Manning Simons, of Charleston, S. C.—The essayist has said that vaginal puncture or incision is an unsurgical procedure. Personally, I would like to know the conditions under which he proposes to abandon vaginal puncture or incision, and I trust in his reply he will tell us under what circumstances he would abandon vaginal puncture and resort to the abdominal method, defining what the conditions are.

Dr. Price (closing the discussion).—From an extensive observation and experience in the study of this class of cases, I would abandon the vaginal method for pelvic disease as we usually find it, puriform disease, or pathological conditions, bilateral or unilateral, of tubes and ovaries; and the discussion indicates that this method would be excluded in such cases in the work of others, as has been very admirably detailed by Dr. McMurtry. With me, I am frank to say, it has not been a matter of exclusion, but I would banish the procedure for pelvic pathology as I find it or as it has been found by those who have taken part in this discussion.

Dr. McMurtry has given you a good picture of the unfortunate and uncomfortable position the men he referred to in his discus-

sion have been placed in from time to time. I remember very well when Segond and others belittled those who thought there was only one side to the shield which to them was gold—the vaginal incision. But I do not hesitate to say that it is a blind procedure; it is a "dismal swamp" operation. They begin in doubt; they end in doubt.

You probably have read the researches of Bernutz and Goupil regarding the ancient history of pelvic disease. It is practically that given by Dr. McMurtry of the French and New York schools, and points out the present position of these practitioners.

Jacobs preceded Segond in this country. He came here on a missionary trip for the purpose of extirpating uteri by the vaginal method. The uterus was extirpated in New Orleans a hundred years ago, a perfectly premeditated, deliberate operation following an accurate diagnosis, and the operation was a common one in this country, and was successfully done long before Jacobs visited America. Jacobs' operations during his visit were rather disastrous, I should say, from an operative stand-point. His operations were neither successful in Washington nor in Baltimore. In Philadelphia he removed the uterus precisely as Dr. McMurtry saw it removed in Paris, leaving the pathology. Surely none of you would trust to drainage to do the remainder. These men have not been dealing with the actual pathology by the vaginal route. These men have been removing the uterus only, leaving the pathology, and trusting to drainage to do the rest of the work. We have been censured by the surgeons of the Johns Hopkins for doing suprapubic operations and draining and saving 90 and 98 per cent. of our cases of suppurative forms of pelvic disease. I say we were censured for resorting to drainage, and some of them said that drainage was an admission that our surgery was dirty, so dirty, indeed, that at the Johns Hopkins they abandoned suprapubic work. They operated on 37 cases by vaginal incision for puriform disease in the pelvis, with one death; three patients returned for a third vaginal incision, and two for a second. The remainder of the cases were distributed all over the country, and doubtless Dr. McMurtry and others have had to remove the pathological conditions from which those patients suffered from above. If it is possible to save ovaries and tubes, it can be done just as well by operating from above. It is doubtful whether

much conservative surgery is practised from below. The tubes are frequently strictured or tortuous. Sometimes a tube is as large as one's flexed thumb, and other structures are involved in the pathological condition. The simple puncture of a puriform tube in which other structures may be affected is usually followed by failure, for the reason that we do not know what we have left. Undoubtedly Jacobs' work was beautiful to witness, for he was a master of the vaginal route. Vaginal surgery is easy, and the facility and ease with which good surgeons can do it have influenced men in selecting this method of operating. Suprapubic work, on the other hand, is not easy. The cases referred to by Dr. Noble are very appropriate in this connection. Dr. Cartledge has reported a similar group of cases. Very few men in this country have been sufficiently observant and careful to recognize these cases. Dr. Noble has had eight cases of intramural abscess or abscess in the fundus of the uterus, which demonstrate very beautifully that other operators have overlooked many of these cases, and hence it explains their high mortality. I have encountered a few of these cases. I have incised these abscesses, and have examined the uterus very carefully to find them. I recall one post-puerperal case of abscess. The appendages were involved. I found a septic and virulent uterus. I opened all these abscesses, put the uterus in a gauze cuff, and the woman got well. Infection must be completely arrested in these cases, and then the patients are likely to get well. No one has demonstrated this subject in a more careful and scientific way than Dr. Pryor. Pryor evidently recognizes that in cases of post-puerperal lymphangitis drainage saves. If you go a step beyond drainage you lose the patient. You cannot extirpate these uteri. It is my impression that the mortality following extirpation of the uterus for puerperal sepsis or childbed fever is fully one hundred. If they do not die from the operation they die of pneumonia the next day. If you open the abdomen in these cases, find muddy lymph, and attempt to pick up and remove gangrenous tubes, you lose the patient. On the other hand, if you confine your efforts to drainage, you save life. If you arrest infection, you save by drainage from above or below, if you save at all.

In suppurative forms of gall-bladder disease, no matter how ill a woman may be, if an incision is made for the purpose of

evacuating or draining the gall-bladder, the patient is likely to get well.

In the case of tubercular abscess referred to by Dr. Noble, his operation would have been a failure if he had simply evacuated the large tubercular abscess and left the old sequestrum. By doing a section from above in such a case, one can do ideal surgery. In a case of tubercular tubes and ovaries, or a tubo-ovarian abscess, by opening the abdomen you can do thorough enucleation, even though you find the omentum and small bowel studded with tubercles. You can free the adhesions from the omentum, remove the adherent portion of it, make a toilet and drain, and you not only cure the patient of the abscesses and remove the pathological conditions, but you cure the tubercular condition of the intestine. So it is in multiple conditions that we find the suprapubic route to be very advantageous and unlike the blind procedure of operating by the vagina.

TREATMENT OF PELVIC AND ABDOMINAL TUMORS COMPLICATING PREGNANCY, WITH REPORT OF CASES.

By Rufus B. Hall, M.D.,
Cincinnati, Ohio.

There are no cases in pelvic or abdominal surgery more trying to the surgeon, nor none that cause so much anxiety, as the ones now under discussion. When we are confronted by a patient who is pregnant and who has a pelvic tumor large enough to interfere with her delivery—the tumor fixed in such a manner that it is impossible to push it out of the pelvis—we have one of the most serious problems to solve that is ever presented to the surgeon. We have the interest of the mother to conserve, and this should be our first consideration. We also must not forget the responsibility we owe to one who is wholly unable to protect itself. I know the wisest course under these circumstances is not a matter of common agreement; the last word in the controversy on either side of the question has not been uttered; but the discussion of these questions in a society like this, by men who are competent to speak, will help to settle many of the obscure points. If they are settled correctly in each individual case, the good name of the profession and the physicians in charge will not justly be subjected to unfavorable criticism. While the cases under discussion do not frequently come under the observation of any one member of the profession, they occur often enough to make this subject one of exceedingly great interest to every man engaged in our special work.

Malignant tumors may develop in such a manner as to block up the pelvis in pregnant women, but this is compara-

tively rare. The large majority of cases calling for relief are pregnancy in a multinodular fibroid uterus or pregnancy associated with an ovarian tumor which blocks the pelvic cavity. For this reason the management of these latter conditions only will be discussed. In illustrating the various complications the author has selected cases from each class. He will give a very short report of these cases later in this paper.

The course to be followed in any individual case will largely be determined by the time the patient is seen. If examined before labor has begun our task is comparatively easy.

The opinion of the profession upon the subject of removal of ovarian tumors during pregnancy has materially changed in the past decade. It is rare that an operation for removal of a tumor before labor has begun is opposed by the general practitioner, even if it is advised before any symptoms threatening the life of the patient are observed. The welfare of the mother, if but one can be saved, should elicit our best efforts. In some of these cases we are compelled to act immediately, knowing full well that we may lose the child, or will lose both mother and child. If we see the patient with an ovarian cyst complicated by pregnancy before any complications arise there can be little hesitation in advising removal of the tumor. There is little additional risk to life on account of the pregnancy. It is impossible before operation to have any intelligent idea whether or not any given patient will abort following the operation. If they do, it is an element of great danger. In some of the most severe operations made by the writer, where there was great trauma to the pelvic floor and uterus itself on account of extensive and firm adhesions to be overcome, and where much handling of the uterus and sponging of the pelvic cavity during the operation was necessary, the patient has not had the least indication of labor, and has gone on to full term of gestation without any inconvenience. In other cases, with very much less injury, fewer adhesions to separate, less handling of the uterus, and

everything more favorable so far as the operation was concerned, the patient has promptly aborted. These are not theories; they are facts, and should be thoroughly recognized in discussing the advisability of an operation. In a large percentage of patients suffering from ovarian cyst associated with pregnancy the tumor is not recognized until several weeks after pregnancy occurs. The increased blood-supply to the pregnant uterus favors the rapid growth of uterine and ovarian tumors. The first knowledge that the physician has of the presence of a tumor is coincident with the knowledge that the woman is pregnant. He then finds himself in the embarrassing position of deciding the very perplexing question before us. I am strongly inclined to believe that the danger to the mother in removing an ovarian tumor, if there are no complications, is not markedly increased by the fact that she is pregnant, yet we must grant that one would not select the pregnant state as an ideal condition for operation.

As illustrating the ease with which patients recover after removal of an ovarian cyst in uncomplicated cases I cite the following cases:

Mrs. H., aged thirty-six years, mother of three children. She had a thin-walled ovarian cyst holding about two gallons of fluid, and was five months pregnant. The tumor had rapidly increased in size for three or four weeks. The patient was suffering from dyspnœa, and was greatly alarmed at her condition. Immediate operation was advised and made on September 23, 1893. In five hours after the operation labor pains came on, occurring at intervals of ten minutes, and continued for several hours. It was necessary to keep her fully under the influence of morphine for four days before the pains had entirely subsided. Except for this, she made an uninterrupted recovery and was delivered of a healthy child at full term.

As illustrating the uncertainty of labor following ovariotomy I cite the following cases:

Mrs. W., aged twenty-eight years, mother of one child, consulted me in June, 1894. She was about twelve weeks

pregnant. She had a tumor filling the true pelvic cavity full and projecting somewhat into the abdominal cavity. The tumor was fixed, and could not be liberated by manipulation. The operation was made June 16, 1894.

The patient had previously had a pelvic inflammation, and the tumor developed from an adherent ovary. The removal of the tumor necessitated much manipulation and handling of the uterus. The adhesions were firm and extensive. The whole pelvic floor was oozing from detached adhesions. Within twenty-four hours after the operation the patient developed acute mania, which continued for six days and required restraint to keep her in bed. The mania was transitory, however, and at the end of the week she was perfectly rational, and otherwise had a smooth and easy convalescence. She was delivered of a full-term living child six and a half months after the operation. There was no indication of labor during her convalescence. No opium was required.

The following case is interesting as illustrating how easily labor is induced in some of these cases. Mrs. C., aged twenty-five years, mother of one child two and a half years old. For three months the patient had suffered periodical attacks of pain due to temporary obstruction of the ureter associated with a movable kidney. The attacks became more frequent and severe and necessitated the use of morphine for relief. She also had a thin-walled ovarian cyst just large enough to block up the pelvic cavity thoroughly. The uterus was enlarged by a pregnancy of eight weeks, and was lifted out of the pelvis above the tumor. The tumor could not be lifted out of the pelvic cavity. Operation for fixation of the kidney and for the removal of the ovarian cyst at the same time was advised and assented to. The operation was made May 17, 1899. The kidney was anchored by the usual incision in the loin and the ovarian cyst removed by a median incision. There was a thin-walled cyst with a long pedicle, but the cyst was adherent to the pelvic cavity, which prevented its liberation before the operation was made. I was able to place a ligature on the pedicle

fully an inch from the uterus. There was scarcely any manipulation of the uterus whatever. The wound healed without a drop of pus. The highest temperature during convalescence was 99°, and pulse 90, yet she aborted at the end of forty-eight hours in spite of all our efforts to prevent it. Otherwise the patient made an easy and perfect convalescence.

These cases emphasize the fact stated before, that it is impossible before operation to have a definite idea whether or not any given case will abort after operation. For this reason we should differentiate carefully as to which case should be operated during gestation and which one should not. Each case should be a law unto itself. It should be studied individually and all the points carefully considered before any conclusion is reached. If the tumor blocks up the pelvic cavity so that the patient could not be delivered, there is no choice for the operator as to what he should advise. The only question to be decided is in regard to the best time to make the operation, and, all things considered, the best time would be to make it as early as possible. If the tumor is above the uterus there is not that urgency for operative interference, yet I would advise an operation for removal of the tumor in preference to any other operative procedure.

The ease with which some cases recover after an ovariotomy should not mislead us to the belief that there is no danger from premature labor or abortion and the complications following it. Abortion at this time is attended with more risk than at any other time, and not a few of these patients die afterward if they abort. Yet this fact should not deter us from advising and making the operation in all cases where the tumor is below the uterus, so that the patient could not be delivered on account of the tumor. After all the facts are placed before the patient and her friends we should not decline to do our duty. If the tumor is of moderate size, with thick walls, and not of rapid growth, I am disposed to defer any operation during gestation unless urgent symptoms develop.

The responsibility of advising an operation for removal of ovarian tumors complicated by pregnancy must always be very great and the anxiety to the operator very trying; but they are not so perplexing and so difficult to solve as is the question of operation for removal of fibroid tumors of the uterus complicated by pregnancy. In an operation for removal of an ovarian tumor, the life of the child is not necessarily sacrificed; in fact, in a large percentage of cases operated on the life of the child is saved. But in fibroid tumors of the uterus the life of the child is frequently, yes, we might say usually, sacrificed, because an operation for fibroids usually means a hysterectomy. Again, the operation for removal of fibroids complicated by pregnancy is frequently an emergency operation in which the life of the child cannot be considered if we are to save the life of the mother. It is fortunate, indeed, that on account of the presence of the tumor these patients rarely become pregnant, yet cases occasionally come under observation in which a woman who has suffered from a fibroid tumor for years and remained childless, becomes pregnant. The increased blood-supply and the rapid increase in the size of the uterus and tumor make the patient so uncomfortable and aggravate her suffering so much that within a few months after pregnancy begins her condition is so urgent that it demands immediate relief. The question of the advisability of an operation must always rest entirely upon the conditions in the individual case. Much depends upon the location of the tumor in the uterine body. In a large number of women who have fibroid tumors and who become pregnant, the tumor is situated in the upper segment of the uterus. In this case the patient can usually be left to nature, with reasonable hope that she will be delivered of a living child in comparative safety. The case should be watched carefully and examined frequently, and an effort should be made to tide her over her delivery without operation. A few weeks later an operation for removal of the tumor could be made if necessary. In these cases it has been advised by some surgeons to operate and enucleate the tumor

and make an effort to save the uterus and the child, but the writer cannot indorse this procedure. It is difficult and almost impossible before opening the abdomen to make a correct diagnosis as to the number of fibroids in the uterus, and the operator must always be prepared to do a hysterectomy. In fact, he will be compelled to do so in almost every instance in these cases.

A very interesting case is that of Mrs. W., aged thirty-two years, whom I was asked to see by her physician in a neighboring city in September, 1897. She had known of the presence of a tumor for several years. She was five months advanced in her first pregnancy, and the rapid increase in the size of the uterus greatly aggravated her symptoms. The tumor occupied the upper segment of the uterus. It was as large as a large cocoanut. There was no danger of obstructing the passage of the child, and I advised against operative interference. With careful attention she went to full term of gestation and was delivered of a living child without difficulty.

A very interesting case, illustrating the blocking up of the passage by a part of a tumor, was that of Mrs. W., aged forty years, whom I was asked to see in the evening of May 23, 1901, with her physician in a neighboring city. She had been married ten years, but had never been pregnant until the present. She had been conscious for several years of the presence of a tumor in the abdomen, and had been treated frequently for the relief of pain caused by pressure. She was about five and a half months pregnant. At the time of my visit she had been in labor two days. Examination revealed the pelvic cavity filled full with one nodule of a multinodular fibroid tumor. The pregnant uterus was in front and above the tumor that blocked the outlet. The cervix could not be reached through the vagina. The membranes were not ruptured. Under an anæsthetic the tumor could not be pushed out of the pelvis. An operation was advised and accepted. The abdomen was opened and a hysterectomy made without opening the uterus. The fibroid

nodule which occupied the pelvis was adherent to the pelvic floor. A long incision was made in the abdomen, in order to remove the tumor without opening the uterine cavity. The patient made a prompt and uninterrupted recovery. The fœtus had the appearance of having been dead for some days.

Using the cases reported as illustrations, the conclusions which may be arrived at may be summarized briefly as follows :

In the very small percentage of cases in which malignant tumors are the cause of the obstruction they should be dealt with according to the well-established principles of modern surgery. The operation should be made at once without any reference to the child, if by so doing there is any additional chance of saving the life of the mother.

(*a*) If the ovarian tumor is thinned-walled, of large size and rapid growth, and the patient is not near her full term of gestation, an operation should be advised, even if the uterus is below the tumor.

(*b*) If the tumor is thick-walled and of slow growth, is not causing much if any inconvenience and rides above the enlarged uterus, an operation is not urgently demanded.

(*c*) If the tumor is small in size, is situated below the uterus, and is fixed either by adhesions or impaction, an immediate operation is demanded.

(*d*) Tapping the tumor for temporary relief should not be done.

(*a*) In fibroid tumors of the uterus associated with pregnancy, where there are but one or two large nodules and they are located in the upper half of the uterus, an operation should be advised only in rare instances. These patients can be delivered safely and be operated on later if necessary.

(*b*) If the tumor is below the pregnant uterus and a large nodule blocks up the passage, an operation should be advised and made early.

(*c*) Myomectomy is usually not to be considered in these cases on account of the increased blood-supply. The writer

would advise it only when an exceptionally favorable tumor for this method is encountered.

DISCUSSION.

Dr. Virgil O. Hardon, of Atlanta, Ga.—Mr. President, I have had a limited experience with tumors of the kind described in this paper, and my conclusions are essentially the same as those expressed by Dr. Hall; yet in some respects, perhaps, my experience has been in a somewhat different class of cases from those which he cites. I have had two cases of fibroid tumor complicating pregnancy, in which I thought it advisable to operate. Those cases were singularly alike. Both were in primiparæ; both were operated on in the fourth month of pregnancy. In one of them the tumor was attached to the right side of the pelvis, and when I was first called to see the patient, in the fourth month of pregnancy, she was suffering from symptoms of threatened miscarriage. I found the uterus pushed over to the left side of the pelvis, with the tumor firmly jammed in between it and the pelvic wall; both the uterus and tumor were so firmly fixed that it was impossible to move them with the fingers in the pelvis. As it was the woman's first pregnancy she was exceedingly anxious to save the child, and as the tumor did not seem to be deeply embedded in the uterine wall, if it were embedded at all, I decided to open the abdomen, which I did, and was able to lift the tumor out of the pelvis with some effort, and I found it attached by a short pedicle. I tied the pedicle in two parts, divided it, closed the abdomen, and the woman made a perfect recovery. She went on to the full term of her pregnancy, and the child is now living. It is some nine years since the operation was performed.

I operated on another very similar case last June. The patient was in her fourth month of pregnancy. Her case differed from the other in this respect, that I had found a tumor before she became pregnant and had advised an operation for its removal. The tumor was attached to the right side of the pelvis, and when she came to me in the third month I found the tumor and the uterus jammed into the pelvis in the same manner as in the case previously reported. The tumor and the uterus were immovable. I adopted the same procedure as in the other case. On opening the abdomen I found that the tumor was not pedun-

culated, but sessile. By tying in several parts, five parts, I think, I was able to so constrict the attachment of the tumor to the womb as to divide the pedicle, separate the tumor from the uterus and remove it. The patient made an uneventful recovery. She is expecting to be delivered next month. [This patient was delivered of a living child on the 6th of January.] Those are my only experiences with the removal of fibroid tumors during pregnancy.

I have seen many cases of pregnancy associated with fibroids; but where a fibroid is so situated as to exert no pressure upon the uterus and cause no interference with pregnancy, I have reached the conclusion that there is no indication for operating until pregnancy has been completed.

In regard to ovarian tumors also my experience agrees with that of Dr. Hall. I operated on a patient about two years ago who was pregnant and had an ovarian tumor on each side of the uterus, which pressed upon the womb, but there were no symptoms of miscarriage. The tumor on the right side was semi-solid, while that on the left was evidently cystic. I opened the abdomen and found on the right side a dermoid cyst, and on the left side a papillomatous cyst. I removed them both. The patient could not have gone on to the full term of pregnancy if I had not operated, because both tumors were so low that they could not have been lifted out of the pelvic cavity by the growth of the womb. They would have precipitated a miscarriage before pregnancy had advanced much further.

In another case of simple, uncomplicated ovarian cyst I removed the cyst in the fifth month of pregnancy. The patient made an uninterrupted recovery, went on to full term, and was delivered of a living child.

In a fifth case I operated for a large pus-tube on the left side. Acute symptoms of peritonitis led me to operate, although knowing she was pregnant. I removed both tubes and ovaries. The patient went on to an uninterrupted recovery, and did not miscarry. These cases are not sufficient in number to form a basis for conclusions, but so far as they go they have led me to believs that abdominal operations during pregnancy are not associated with any more danger, so far as the life of the mother is concerned, than operations on women who are not pregnant. The danger from miscarriage and death of the child is also comparatively small.

Dr. George H. Noble, of Atlanta, Ga.—My observations regarding fibroid tumors during pregnancy are practically the same as those that have been expressed. The question of removal of these tumors should be based mainly upon mechanical obstruction to labor. Of course, there are a few exceptions, such as twisted pedicles and inflammatory conditions, which should be dealt with. If the tumor or tumors are in the lower segment of the uterus or pelvis, in advance of the fœtus, it is necessary to remove them, or the uterus must be evacuated, and as these tumors can be removed with considerable safety, with a chance of saving the life of the child, it is a feasible operation. I have had several cases of fibroids, in one of which it was necessary to do a myomectomy (for intramural tumor). One interesting feature was an apparent migration of the tumor. In the first pregnancy the uterus developed posteriorly more than anteriorly, forcing the tumor upward on the posterior wall of the uterus. In the second pregnancy the development of the uterus was more anteriorly, forcing the tumor downward directly in advance of the child. The woman was four and a half months advanced in pregnancy. The tumor was down in Douglas' pouch, presenting in the vagina. The question of evacuating the uterus or removing the tumor was placed before the patient. She consented to its removal. An incision was made through the peritoneum and outer muscular coat, not the full length of the tumor, but large enough to enucleate the tumor from its capsule, aided by gentle traction. There was very little bleeding from the wound, but it required very great care in stitching the incision to prevent tearing out of the sutures. The uterine structures are so much softened in the pregnant state that slight violence may lead to serious results. She recovered without an unpleasant symptom, and to-day has a child about three years of age. In some cases the fibroids are pedunculated; in other instances the pregnant uterus is situated within a nest of fibroids, perhaps a dozen or more, the majority of them in the lower segment of the uterus, the cervical portion elongated four or five inches, rendering impossible delivery of a living child. In such instances it is necessary to do a hysterectomy and destroy the life of the child. There are still other cases in which the tumors are ovarian or dermoid in character, with long pedicles lying down in advance of the uterus. I recall one such case in which the woman was seven months advanced in pregnancy. In this

case I was able to turn out the tumor without any unpleasant after-symptoms. Judging the surgical work I have done in this line, I am prompted to say that it can be accomplished with more safety than we have been willing to admit.

Dr. Hall (closing the discussion).—I desire to thank the gentlemen for the free discussion of my paper. We are all practically agreed as to the advisability of operative and non-operative intervention in these cases, and this is the point I have striven to emphasize particularly. There are some cases of fibroid tumors and of ovarian tumors complicating pregnancy that are better not operated on during gestation, for the reasons given in the paper. I agree practically with all of the gentlemen who have discussed the paper. No one would do a hysterectomy if the tumor were favorably situated.

The case mentioned by Dr. Haggard was a favorable one for myomectomy. Possibly that particular patient might have gone through gestation without an operation. I am sorry the doctor did not mention the symptoms.

Dr. Haggard.—The main feature in the case I reported was pressure of the diaphragm; the woman had a respiration of 72.

Dr. Hall (resuming).—Dr. Noble's case demanded immediate operation. He acted wisely. In doing myomectomy the chief danger is the control of hemorrhage, and if that cannot be done he can do a hysterectomy afterward. From the simple fact that a woman has a tumor complicating pregnancy, it is not necessarily good practice to operate on her immediately. If there are symptoms justifying operation for her best interests, it should be done. The pendulum has swung too far in operating on tumors as soon as they are discovered, even though a woman is pregnant. If we could have complete records of all cases operated on of ovarian tumors during pregnancy, I am sure the mortality would be high. The same is true of fibroid tumors complicating pregnancy. Therefore a note of warning.

A UNIQUE CASE OF EXTRA-UTERINE PREGNANCY.

By H. Tuholske, M.D.,
St. Louis, Mo.

A classification of ectopic pregnancy upon the basis of the site of the implantation of the fertilized ovum can logically contain only three primary forms, viz.: the tubal, the ovarian, and the abdominal. In the first of these some combination forms occur, the tubo-uterine, the tubo-ovarian, and the tubo-abdominal. From these primary many secondary forms may arise. Tubal pregnancy is the most frequent. There cannot now be a question of the occurrence of ovarian pregnancy; a considerable number, some thirty cases, have been satisfactorily demonstrated. Its postulates are the absolute exclusion of any involvement of the tube of the same side in the formation of the gestation sac, and the ovarian ligament must be connected with and become part of the gestation sac.

Unquestionable cases of primary abdominal pregnancy are not on record. In a given case both tubes and ovaries, even the fimbriated extremities, must be proven to be absolutely free from gestation changes. Whether a fertilized ovum may become implanted and develop in the free peritoneal cavity is doubtful. From *a priori* reasoning it would appear possible. Secondary abdominal pregnancies have been frequently described; their usual fate is arrest of development, with subsequent changes resulting from encapsulation, calcification, or suppuration.

The fate of tubal pregnancy is usually tubal rupture or tubal abortus during the first four months. As in uterine

abortion, so in tubal, the complete loosening and escape of the gestation sac offers the more favorable prognosis. In tubal abortion, however, the likelihood of such complete separation is small, on account of the muscular inefficiency of the tube. When it occurs the tube can contract, the hemorrhage ceases, and the ovum in the abdominal cavity may undergo absorption. Whether this occurs frequently is hard to prove, since the symptoms of tubal abortion, with complete extrusion of the sac, are infinitely less startling than those with partial retention or tubal rupture. When, in rupture of the tube, the gestation sac escapes into the abdominal cavity, its placental attachment to the tube remaining, the fœtus may go on developing ; so it may, when the gestation sac bursts, the fœtus escaping into the abdominal cavity, lying on and between the intestinal loops, its umbilical cord reaching to the attached placenta in the tube. But all writers say that the proposition of a gestation sac containing a very young fœtus escaping out of the tube into the peritoneal cavity, and there becoming implanted and forming real placental connections and live, is not to be entertained. The following case will absolutely prove that all this may occur and the child live and go on to full developments.

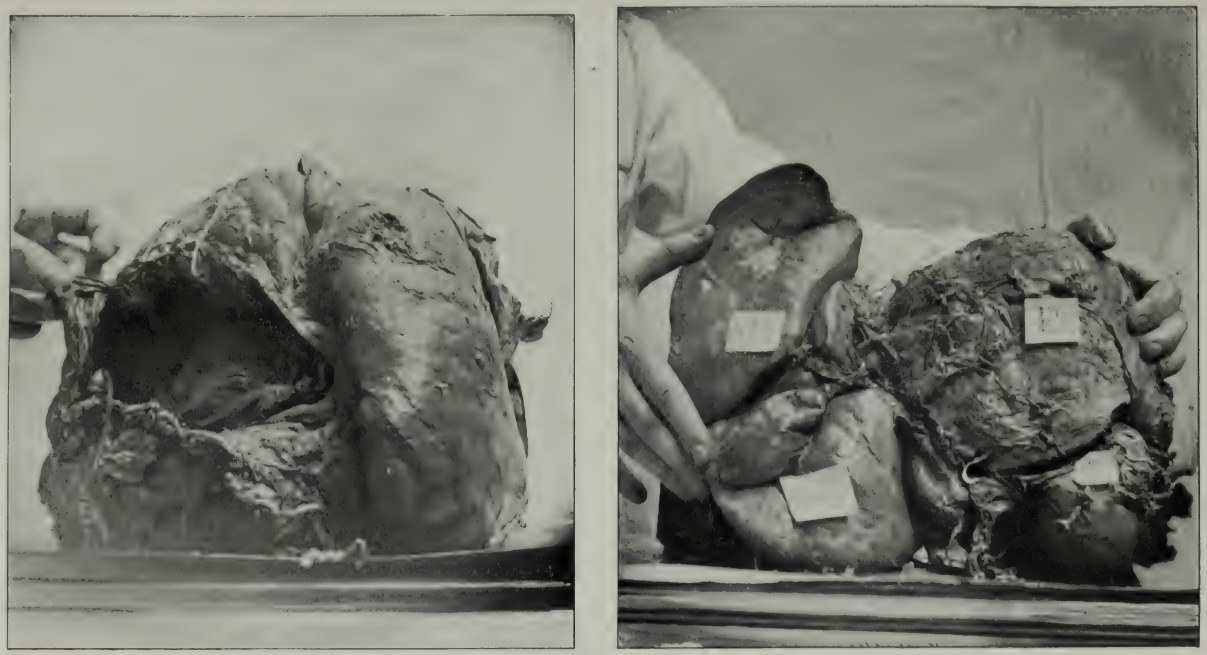
On May 10, 1900, Dr. John M. Grant, of St. Louis, called me in consultation to see a woman who had been in his care for some weeks and presented the following history :

Mrs. X., aged thirty-nine years, married, of small figure, weighing about 110 pounds, has given birth to six children in the course of twelve years. Her pregnancies and deliveries presented nothing abnormal ; had been enjoying fair health without being robust. Menstruated the last time during the latter part of the last week of December, her flow ceasing about the 5th or 6th of January.

Missed her menstruation in January and February and thought herself pregnant, feeling the same as in her previous pregnancies. About the middle of March she was suddenly taken with severe pain in the abdomen, which symptom, however, was overshadowed by a feeling of

intense weakness and by collapse. Dr. Grant found her in a condition apparently approaching dissolution ; patient, however, rallied after some hours under the administration of stimulants hypodermically administered. She remained very feeble for some time, keeping her bed. Pains of an indistinct character recurred frequently, her pulse remained small and rapid, had no appetite, was occasionally nauseated, had some discharge from the uterus, but did not know whether it had been bloody. An examination showed vulva somewhat swollen, free mucopurulent discharge, vestibule of bluish tint, vagina capacious, the cervix softer than normal, uterus the size of a pregnant one of from ten to twelve weeks ; tube and ovary on the left somewhat thickened and adherent ; right side, nothing abnormal ; no sign of an exudate, hæmatocele, or any mass or swelling whatever, either on the right or the left side. From the history of the case an extra-uterine pregnancy was expected, but the pelvis was absolutely free and offered no clue as to the attack, which clearly meant a sudden hemorrhage. Examination of the abdomen showed its lower zone, that is the space above the symphysis pubis to about half-way to the umbilicus and laterally, resonant on percussion, above that point dulness of the whole abdomen continuous with the liver dulness.

The lower margin of this body or mass could be easily outlined through the thin and flabby parietes, felt perhaps one-half in thickness ; the fingers could be easily pushed under its margin, militating at once against the thought of its being a placenta. It was an enormously enlarged liver ; the spleen was not palpable ; chest examination negative, except rapid and feeble heart action. Examining the back an asymmetry of the two sides was at once noticed. On the right lumbar region, reaching midway between the last rib and the crest of the ilium, was a well-marked protuberance, imposing at first as a kidney growth. The swelling was dull on percussion, but could not be bimanually palpated, the liver covering its front ; there were no symptoms referable to any kidney disease.



A unique case of extra-uterine pregnancy.

Auscultation over this protuberance elicited a bruit, which was like a placental bruit, and extended well to the front and upward. In spite of the total absence of pelvic findings, the history pointed to an interrupted pregnancy, an escape of the fœtus out of the tube and its lodgement in the abdomen somewhere between the enormous liver and the kidney. The patient was removed to hospital for observation, and examined daily ; never failed to hear the bruit ; five days later I thought I felt and heard the movements characteristic of quickening. Here was a dilemma. In secondary abdominal pregnancies originating in a complete extrusion of the sac and fruit, death of the fœtus is expected.

Here was a living fœtus somewhere in the cavity, covered by an enormous liver, and the patient with rapid pulse and general bad condition. Would the fœtus die and become encapsulated? Would the sac become infected and suppurate? Did the patient seem likely to outlive either? Not knowing the exact place of the placental attachment, I thought I might perhaps remove the fœtus, tampon the sac, and carry the patient through. I determined to explore and satisfy myself as to the exact conditions. I operated on May 16th—abdominal incision in the median line from above the umbilicus to near the pubis. Liver margin half-way between umbilicus and pubis, thick, dark blue, and venous. The hand in the pelvis confirmed absolutely the findings of the bimanual examination, uterus large, as described, left ovary and tube adherent, right ovary and tube apparently normal ; neither on the uterus nor the adnexæ any macroscopical sign of rupture ; visible intestinal loops unaltered. The thickness and width of the liver made it impossible to lift it for high exploration, so I extended the incision to the ensiform cartilage ; under the parietal peritoneum lay the liver, nothing else visible ; retractors applied to raise the parietes from the liver to allow of inspection brought about a terrible catastrophe.

A retractor slipped and punched a hole into the friable liver. Hemorrhage became profuse, inundating the whole

field. Attempted suturing of no avail. An iodoform gauze tampon firmly pressed down controlled the bleeding, only to return on taking off the pressure; patient's condition bad.

To find means for continued pressure I introduced a thick round piece of gauze between the parietes and the liver from side to side over the intrahepatic tampon; this extensive surface pressure controlled the bleeding. And so far no sign of a fœtus. I finally managed to raise the liver by its lower margin and look upward toward the diaphragm. On the under surface of the right lobe of the liver above the transverse fissure there appeared a convex protuberance of circular shape, traversed by innumerable large arteries and veins and seemingly forming part of the liver. On touching it, I found it pulsating, of doughy consistency, perhaps almost cystic. No line of demarcation between liver and the base of the mass. No point of attack anywhere. Patient being by this time in a very bad condition, I reluctantly ceased further exploration, closed the cavity, leaving the broad gauze tampon. The surgeons present at the operation, seeing all I could see, thought there was no pregnancy at all, and that the vascular pulsating swelling on the under surface of the liver, its immense size and generally enlarged condition, and the bruit heard before, made up a picture of tumor cavernosus of the liver; from which opinion, however, I much subduedly differed. Dr. Jonas, who was associated with me in the case from the first day, shared my opinion all through. The woman was very sick for some days, pulse 140 to 160 per minute; tampon removed on the fourth day, and finally recovered from the operation. Patient returned to her home at the end of the third week, but there was no return to health; she remained weak and kept her bed for weeks, Dr. Grant watching the case carefully.

Unfortunately, the husband of the patient had been told by one of the surgeons present at the operation that his wife was not pregnant, but had a growth of the liver. This statement had been accepted, and I saw nothing of the patient for some time. Finally, however, the case cleared up; the

woman felt free movements of the child, but, as she said, in a very queer place. An examination at that time showed a great enlargement of the upper right side of the abdomen, bulging into the right lumbar region, liver as large as before and reaching into the left hypochondrium, the heart pushed somewhat to the left; movements of the child very strong, and heart sounds clear. One of my hands upon the right lumbar, the other upon the epigastric region, marked the limit of the space of the child's excursions. Patient feeble, pulse rapid, respiration impeded, face dusky. Husband and wife now expected delivery per *vias naturales;* we could but wait and watch. Finally, in September, the fœtus, according to my reckoning, being almost nine lunar months old, and the patient's condition, from interference with respiration and circulation, having become intolerable, she consented to go to the hospital. Dr. E. W. Saunders, chief of the Bethesda Lying-in Hospital, examined patient at my request, and admitted her to his hospital. We at once prepared patient for operation, and two days later, in the presence of Dr. Saunders and his staff, and of Dr. Grant, assisted by my own staff, I proceeded to remove the child. Patient on left side; incision from tip of right last rib downward, forward, upward, like Koenig's incision for nephrectomy, through all the tissues, parietal peritoneum, and gestation sac, which had become adherent to each other. After some hunting found thin part of sac, opened and enlarged the incision to readily admit my hand, caught the feet of the child and extracted a lusty girl baby, well developed, weighing six and one-half pounds; the cord thick and long; tied and cut cord as is usual. The amniotic fluid having escaped externally, the cavity, which was enormous in size, was tamponed firmly. The general peritoneal cavity had not been opened; the hand in tamponing passed upward, between the liver and kidney, to the diaphragm.

Patient regained consciousness, appeared to suffer greatly, and was very feeble, pulse 140. Administered strychnine and digitalis hypodermically; twenty-four hours later patient

complained much, and since the temperature was rising rapidly, we took off the dressing to change the amniotic tampon. This was readily effected, and we gazed with interest into the immense cavity illuminated in its entire extent by a light held at its opening. Presently something awful happened. The placenta became turbid, blue, swollen, increasing in volume before our eyes, filling the cavity, approaching the opening, and moving toward us in a most gruesome way. I can illustrate its approach perhaps best in the following manner: Imagine in a cadaver the chest muscles removed, intercostals and all, a normal lung compressed against the spine; now let a bellows through the opened trachea inflate the lung, see it rapidly swell up, fill the thorax, and crowd through the open intercostal spaces tense to bursting. Such was the rapid filling of the placenta, its motion, and the imminence of a burst. I did not wait, but crowded the gauze against the approaching mass, compressing and repressing it until the cavity was firmly filled.

Patient looked during those minutes like one rapidly bleeding to death. She rallied somewhat for a short time and then died eight hours later, thirty-two hours after the removal of the child. Post-mortem examination, by agreement, restricted to the abdomen. Liver enormously enlarged and very vascular, turned on its axis until its right border, presenting near the median line of the abdomen, had become the anterior border, passing through the epigastric into the left hypochondriac region; placental cavity occupying the right hypochondriac and part of the right lumbar region, placental attachment to diaphragm, liver, and kidney. No attachment to any other viscera; intestines free and normal. Uterus enlarged, corpus globular and soft; left ovary and tube thickened, enlarged, and adherent; right ovary and right tube apparently normal. Liver, placenta, kidney, ovaries, and tubes removed for examination.

Report of the Histological Examination, by Dr. C. Fisch, of St. Louis.

The specimen consisted of the following organs and tissues:

1. Liver with fœtal sac attached to it.
2. Right kidney connected with the sac by fibrous adhesions.
3. Piece of parietal diaphragmatic peritoneum, to which fœtal sac was attached.
4. Left tube and ovary, the tube being severed at the uterine end (both in connection).
5. Right tube cut off at uterine end.
6. Right ovary.

The anatomical relations of the fœtal sac to the liver and other structures.

From the specimen itself and the previous history of the patient, the conclusion can be drawn that the young sac, after having made its escape, found its way toward the space between the liver and peritoneum; or, more accurately, it must have attached itself in that fold of peritoneum where the parietal layer is reflected over the under surface of the liver, forming the lower lamella of the coronary ligament. Since it is certain that the escape took place at a time where a chorion fondosum was already well developed, we can safely assume that the latter came in contact with the diaphragmatic peritoneum and the upper margin of the under surface of the right lobe and of the lobus spigelii of the liver.

The sac developed with the greater part, about three-quarters of its placental site, on the parietal peritoneum; the remaining portion of the placenta is closely connected with the under surface of the right lobe of the liver, reaching to a line a little above the transverse fissure. A very remarkable change has taken place along the right half of the upper border of the right lobe. As the sac enlarged and the pressure increased, this upper border of the liver was drawn out and compressed into a thin lamella. The under surface of

this lamina is in close connection with the chorionic membrane. The anterior part of the chorion læve, as well as part of the posterior portion, consists simply of the chorionic membrane—very loose and easily detachable fibrous and fibrinous adhesions bring them in close proximity to the surroundings. An exception is the region which is in relation with the right kidney; here very firm fibrous union has taken place. There were no close relations to the contiguous portions of the intestinal canal.

The Placenta. The placenta was about the normal size and shape. Preserved in formalin it measures 13 centimetres in diameter, is more or less circular, and has a thickness of from 2.2 to 5 centimetres. While on the whole extent of its attachment to the liver (—one-quarter of the whole placenta) it is inseparably connected with this organ, the three-quarters of its peritoneal insertion are covered with a gray, thin membrane, which can be easily detached in small flaps, as in the basal plate of the normal placenta. Its surface is comparatively smooth and shows here and there small, whitish patches. In small areas the continuity of this surface is interrupted, pieces of the membrane having been torn off.

There is no sharp boundary of the placental tissue proper, but a gradual tapering off. The funis is not inserted in the area of the placenta, but in that portion of the chorionic sac where the thinning of the placental tissue has become quite marked (about 4 centimetres from the border of the placenta proper). The appearance is, therefore, that of a placenta velamentosa. The external surface of the parietal placenta does not show any divisions into cotyledons, a point which was also found to obtain for the hepatic part of it.

The microscopical examination of the chorionic sac shows nothing remarkable; the amniom is almost everywhere closely glued to the chorion; only in limited spaces clefts between the two membranes can be seen. As to the course and distribution of the umbilical vessels no abnormalities were noticed. On the amnion the epithelium is everywhere well preserved, while the chorionic epithelium is lost along

long stretches and replaced by irregular layers of hyaline fibrin. Perfectly normal conditions obtain for the villi. Owing to the advanced stage of pregnancy, in a great number of them retrogressive changes have set in. The lining consists mostly of a narrow, deeply staining zone. In some places is the Langhans layer, and in others the syncytial coverings are preserved.

The structure of the parietal and hepatic placenta will be dealt with separately.

Parietal Placenta. As already stated, the parietal placenta forms three-quarters of the whole placenta. On cross-sections the following can be observed: the subserous tissue is compressed into a very thin lamella of fibres, with few cells and some round-cell infiltration.

The border toward the placenta is marked by a thin layer of fibrin, the line of separation of the placenta. Overlying this is the peritoneum proper, forming the maternal part of the placenta. In most places it is very thin, and consists almost entirely of large decidual cells, with few round cells interspersed. The endothelium has disappeared, and in its place a fibrin layer of variable thickness is seen. Right under this layer the decidual cells form a continuous stratum, while lower down they are met with in small groups. In some areas the thickness of this layer is considerably increased, owing mostly to an enormous dilatation of the vascular structures. The walls of these vessels have become extremely thin, the picture giving the impression of an angiomatous condition. To differentiate between arterial and venous vessels was, even by means of elastic fibre stains, impossible. Large masses of decidual cells fill the interstices between these lacunæ, and sometimes protrude into the intervillous space in the shape of irregular processes. But the villi penetrate nowhere the maternal tissues; they never break through the fibrin lamella. The blood-supply of this part of the placenta did not appear abundant by any means. How far the reactive changes in the peritoneum extended beyond the sac attachment—in other words, how far the picture of a

decidua vera could possibly be traced over the surface of the peritoneum—could not, of course, be determined. From the analogon of other organs there is no doubt that it was present to a considerable degree. There was certainly nothing found that in any way suggested the previous formation of analogon of a reflexa.

Hepatic Placenta. Perhaps the most interesting feature of the case lies in the partial union of the placenta with the liver, which comprises about one-fourth of the whole extent of the placenta proper and a large part of the chorionic surface. The site of attachment has been stated before. How the liver was forced out of place can be understood if we consider that the placenta forms the stable point from which the force acted.

The liver tissue at a distance from the placental attachments has undergone little change. There is above all nowhere fatty degeneration or fatty infiltration beyond what must be considered physiological. At and around the placental insertion, however, the most curious phenomena are seen. The liver appears to the naked eye as a sponge-like mass, honey-combed by numberless larger and smaller holes of the most varying size and shape. Toward the placental surface these holes are so close together that but little substance between them can be made out. This surface itself is very irregular and shows a great number of variously shaped protrusions, which reach up in between the villi. Viewed with a low power, it is everywhere covered with a thin grayish lamella which separates it from the intervillous space.

Microscopical examination of the deeper layer of the liver shows active proliferation of the connective intralobular tissue. The portal structures are greatly dilated. The bile-ducts show a pronounced proliferation and a profuse desquamation of cells which, in many places, fill completely the lamina of the ducts. The central veins take no part in these changes.

In the portions nearer the placental surface the lobules become more and more compressed, until at last they appear as narrow bands of pigmented cells between broad layers of

fibrous tissue. But the liver cells retain everywhere their normal appearance and do not show any degenerative transformation. The placental surface is covered with a homogeneous layer of hyaline fibrin in which the villi are attached.

The communication of the various vascular structures with the intervillous space takes place by direct opening into the space; a good many of these vessels have wide, funnel-shaped mouths. In numerous places the villi are seen to penetrate into the venous sinuses for a considerable distance. Pieces of them are torn loose and are found deep in the liver substance, forming emboli. Most of them show degenerative hyaline changes. Others have become organized and present themselves in the shape of fibrous thrombi. The tissue between the blood sinuses and under the fibrin layer shows œdematous and round-cell infiltration. The connective-tissue fibres are widely separated. In this stroma are embedded large numbers of cells which in every respect have the appearance of decidual cells. The intervening thin layer of peritoneum between this part of the liver and the placenta has altogether disappeared. No trace of it can be found. A separation of the liver from the villous growth appears impossible.

There is a gradual subsidence of the phenomena described toward the thinner flap of the liver. The thickness of the placenta gradually becomes less and less, the sinuses grow smaller and more compressed, etc.

The adhesions between the chorion and the different organs do not offer any special interest. They consist simply of fibrinous deposits. Wherever they are formed of fibrous tissue, degenerated villi are seen, showing that even this part of the chorion was active in trying to bring about attachments, and, perhaps, afford means of nutrition.

THE RIGHT KIDNEY. The upper border of the right kidney is bound to the placenta by especially dense and massive connective-tissue structures. The latter form lamellæ of varying thickness, which are of interest because of the great amount of degenerated villi. The adhesions were

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found firmly united with the capsule of the kidney. In the cortical zone the epithelial cells and the glomeruli were nearly completely obliterated. Otherwise the kidney did not show any changes of interest except some degenerated villi in the adhesions around the kidney.

Ovaries and Tubes. Aside from its general interest the examination of the tubes and ovaries was necessary to establish the exact location of primary attachment of the ovum, as there could be, according to the history of the case, no doubt that this case was originally one of tubal or ovarian pregnancy. The right tube appeared about normal but for a distinct enlargement and widening of the abdominal end; the left tube was bound down by old chronic adhesions to the ovary and broad ligament. The right ovary showed some cystic degeneration and a well-developed fresh corpus luteum, while the left one was altogether destroyed by a number of abscesses and colloid cysts.

The whole right tube was cut into sections for histological examination. From the uterine end through the whole tube the mucous membrane was considerably swollen, its columnar epithelium had become more cubical. The bloodvessels were considerably dilated, and the muscular layers appeared thinner than normal. Some of the folds had taken on peculiar club-shaped forms, consisting almost entirely of decidual cells. About one centimetre from the fimbriated extremity, which was considerably enlarged, the primary placental site was found, although in a stage of fibrous change. The tubal walls here were extremely thin and showed a high degree of round-cell infiltration. At the site of the attachment an irregularly bordered mass of tissue was found which toward the lumen of the tube showed a ragged edge. It consisted of decidual cells, immense numbers of round cells, and young connective-tissue cells. In some places it was stained brown from old hemorrhages. The mucous membrane at this place was greatly swollen, consisting almost entirely of decidual cells. The diameter of the area was in the present state about 0.7 centimetres. Near the fimbriæ and toward the uterine end

of the tube the decidual changes were less marked, although demonstrable everywhere.

These findings confirm the diagnosis of tubal abortion which had been made *intra vitam*. The extensive retrogressive and reparative processes speak for a very early interruption of the tubal pregnancy.

The right ovary shows on a considerable part of its surface a layer of decidual cells. Externally the right ovary is covered with flattened genuine epithelium. The left tube represented the picture of chronic salpingitis. The left ovary contained a great many small abscesses and colloid cysts.

Everywhere in the liver necrotic foci of smaller and larger extent were observed. The foci contain a large number of medium-sized bacilli with rounded ends. They always appear single, in some fields surrounded by a capsule. The necrosis of the surrounding tissue shows that they are not post-mortem products. The fœtal tissue, as well as the maternal placenta, were found free from bacilli.

RÉSUMÉ. Tubal pregnancy (ampullar) of the right side; tubal abortus, with complete extrusion of the gestation sac, unruptured and containing fœtus; hemorrhage and position carried sac up to the diaphragm between the right lobe of the liver and upper end of the kidney. Implantation in the parietal peritoneum of the diaphragm as far forward as the attachment of the coronary ligament, and in the liver from its upper border to the transverse fissure; down the diaphragm posteriorly and in the upper end of the kidney. Establishment of placental connections, allowing the development of a well-developed living child and pushing the liver in its growth toward the left and turning it upon its axis, with the coronary ligament as a fixed point, until the right margin of the liver became the anterior. Histological examination shows original implantation in the ampulla of the right tube and the formation of a placenta by efficient transformation of the peritoneum and the liver tissue adjacent. The diagnosis of the case from its history was confirmed by clinical, operative, pathological, and histological evidence.

THE SURGICAL TREATMENT OF PAINFUL MENSTRUATION.

By Henry D. Fry, M.D.,
Washington, D. C.

Pain should not occur at the menstrual period in a healthy woman with healthy pelvic organs. This dual relationship between the general health and the generative organs must be constantly kept in mind. One or the other may be at fault, or the trouble may be with both in the same case.

The want of exercise and fresh air; overwork, mental or physical, and poor food bring about impoverishment of the blood, neuralgic affections and dysmenorrhœa in a woman having healthy pelvic organs.

Stenosis of the cervical canal, endometritis, displacements of the uterus, and diseases of the appendages, produce the same result in a woman with excellent general health. A third class comprises those unfortunate women who have a combination of these causes, and who consequently suffer because their general health is impaired and because they have local pelvic trouble.

The treatment of the first class does not come within the consideration of this paper, *i. e.*, it is not surgical.

The third class is both medical and surgical, and it is important not to overlook the medical side of these cases. The concentration of the attention too closely to the surgical aspect of the case is often the cause of failure to give relief. Good food, exercise in the open air, change of climate, relief from overwork and overstudy, regulation of the bowels, and careful attention to all the habits of life, must go hand-

in-hand with proper surgical treatment. Inquire into the daily life of the young girl or woman. Ferret out that which is injurious to her health, and give directions to correct it. If she be a school-girl, does she eat a hasty or very light breakfast, and does she omit the morning evacuation of the bowels in order to reach school in time? Are the mid-day lunch and recreation-time neglected? So often she, or the woman who is employed to perform clerical duty, returns home tired—the one to study and the other to rest until bed-time. One day is the repetition of another, and both breathe the atmosphere of indoor life twenty-two or twenty-three hours out of the twenty-four.

The importance of these matters demands the above brief consideration before passing to the strictly surgical treatment of painful menstruation. And this carries with it the necessity of making an examination of the pelvic organs. As these sufferers are nearly all young girls or unmarried women, some hesitation must be felt in subjecting them to the ordeal. It is our first duty to obtain a clear history of the case, and if the patient is one who probably belongs to the first class of the three above described, she should have the benefit of general treatment before other means are considered. Rest at the menstrual periods should be enjoined and care taken to avoid exposure to cold at these times.

Another point to take into consideration is the character and severity of the pain. When it is not acute or it is limited to the first day or two, and when the patient is relieved and well during the intermenstrual period, it would seem that active surgical treatment were not demanded. On the other hand, when she suffers great pain, or pain extending over a number of days, and is left weak, hardly recovering from one period before another begins, and when she is compelled to seek relief by the use of stimulants or opiates, the time has come when sentiment must be put aside.

Still another consideration that will bear weight is the importance of the health of the patient to herself and her family. If she be blessed with a comfortable home and can

afford to be nursed several days in every month, she can better do without surgical relief than the less fortunate sister whose daily life depends upon her health and who must work to support herself or those dependent upon her.

Admitting that a case has fulfilled all the requirements and is a proper one for surgical treatment, what results can be expected? If we judge by the pessimistic statements of some men of large experience, it is nothing to be proud of. In the discussion of this subject at the last meeting of the American Gynecological Society, held in Chicago, the reflected opinions presented a gloomy picture for the woman.

My object in presenting this paper is to protest against that verdict rather than offer any original method. My experience has been just the opposite. I feel that I can safely say that three out of every four have been permanently cured or greatly relieved.

Failures have been due, as a rule, to some complication, the removal of which subsequently resulted in cure. No other operation in gynecological surgery has given so much satisfaction as the one I employ to relieve uncomplicated cases of dysmenorrhœa. Goodell suggested the method of rapid dilatation. Relief was often obtained for a while, but recurrence required a second or a third operation.

Rapid dilatation was supplemented by curettage. Then the application of caustic agents to the denuded endometrium, and drainage with gauze or the use of some form of drainage-plug was added to the technique of the operation.

The line of treatment followed with such satisfactory results is that pointed out in the main by Dr. Gill Wylie. First, thorough dilatation of the cervical canal; then the endometrium is gone over carefully with the sharp curette; irritation, and often a second curettage; the application of pure carbolic acid; irrigation and dilatation repeated if necessary.

A Wylie drainage-plug, as large as will readily pass, is inserted into the cervical canal and held in position by a Smith pessary. For a number of years I was accustomed to

leave the plug *in situ* six days, but following the suggestion of Dr. Wylie, I now allow it to remain from three to six weeks, and the result is better. I usually keep the patient in bed two or three weeks after the operation, and if no discomfort be experienced, permit her to get up and go around wearing the plug several weeks longer.

I believe the use of the hard rubber drainage-plug does much to add to the permanency of the relief obtained. When retained sufficiently long it causes the formation of a cicatricial ring of tissue at the point of constriction which ensures patulency. I have not seen any bad results follow its use. In a few cases it causes pain, and on that account must be removed sooner than the specified time.

I attribute the failure of those who deplore their results to the omission of some important point in the technique of the operation. For instance, they simply dilate the cervix or dilate and curette. Another cause of failure is the unfortunate division and subdivision of the disease into varieties, each variety being described with its appropriate method of treatment. The desire to avoid empiricism has made the subject complex and impracticable.

For all necessary purposes, dysmenorrhœa can be divided into two classes; simple and complicated. The simple comprises about 80 per cent. of the cases that come under our care, and the treatment described cures or greatly relieves three out of every four.

The conditions usually found on examination are as follows: The external genitalia are undeveloped; the vagina, cervix, and uterus are small. There is stenosis of the cervical canal and endometritis. The uterus is normal in position, or one of exaggerated anteflexion; it is movable and the appendages are healthy.

The accompanying endometritis is chronic and due to deficient drainage of the cavum uteri in consequence of the stenosis of the cervical canal. This undeveloped condition of the generative organs in young women is very common, and is parallel to deficient growth of the mammary

gland and its consequent failure to perform the function of lactation.

The second class comprises the cases in which some complication exists. It may be displacement, small fibroids in the body of the uterus, of disease of the tubes or ovaries. Besides the surgical treatment described, displacements must be corrected by the use of a proper support or a radical surgical operation employed : small fibroids removed by myomectomy and diseased tubes or ovaries resected or excised. In a very small proportion of cases, as in cirrhotic ovaries, we are driven to produce the menopause artificially. In such cases, I believe it advisable to amputate the uterus at the same time, as the subsequent reflex nervous symptoms are diminished and the period of suffering shortened.

A not uncommon condition described is painful menstruation associated with a prolapsed and tender ovary of one side. If relief does not follow the surgical treatment recommended, a second operation for the removal of the diseased ovary will be necessary. Those who describe the ovarian type of dysmenorrhœa look for the pain to occur during the week preceding the flow, and expect relief with its appearance. While this is practically true, it cannot be accepted as a diagnostic symptom of that particular type. In the following case, for instance, the pain was due to ovarian disease, but the appearance of the flow did not bring relief.

Miss W., a trained nurse, suffered so much pain at her menstrual period that it interfered with her duties. She desired relief, and was willing to submit to whatever means was necessary to secure that end. Her menstruation began at the usual age, and was accompanied at first with backache. Dysmenorrhœa increased in later years. Three or four days before its appearance she was troubled with nausea ; two days before with pain, which was at its worst the day immediately preceding the flow.

The first day of pain it was confined to the right side ; the econd it extended down the front and outside of the correponding leg. Her sickness lasted three days, and the nausea

and pain ceased only with the cessation of the flow. A simple dilatation had been done one year before she came under my care.

No benefit was experienced from that nor from the subsequent operation I performed by the method described in this paper.

Three years later I removed the right tube and ovary, and she has since (nearly two years) menstruated painlessly. This case demonstrates that although the dysmenorrhœa was strictly due to ovarian cause, the symptoms continued throughout the menstruation.

A second case, with a history almost identical, recovered completely after the removal of the right tube and ovary and two small fibroids from the uterus.

I maintain that the surgical treatment here described as applicable to a large percentage of cases of painful menstruation is not empiricism. We must recognize and exclude cases due to constitutional causes and must recognize and give other treatment appropriate to any complications that exist in other cases.

DISCUSSION.

Dr. Floyd W. McRae, of Atlanta, Ga.—I think the paper of Dr. Fry is an interesting and timely one, and I agree with everything that he says except as to his method of operating. It seems to me the Wylie drainage-plug is unnecessary in many of the cases, and is a source of danger. In those cases where a contracted os and cervix have been the cause of painful menstruation, particularly those that have come under my observation, a simple method of treatment can be resorted to. Dilatation of the cervix, not too radical, with curettage and washing out the uterus at the time of the operation, without the application of any caustic to the endometrium, packing cavity with gauze simply for its cleansing effect, then withdrawing gauze. Keep patient in bed for a week or ten days. Introduce shortly after each menstruation for about three months a full-sized 28 to 30 short, curved sound. If there is a return of the painful men-

struation, then there should be subsequent dilatation of the cervix. This method will usually afford relief, and it has less danger than the method which Dr. Fry has described, giving due credit to Dr. Wylie.

Dr. Edwin Ricketts, of Cincinnati, O.—We all know that quite a large number of these cases are permitted to go on and result disastrously if nothing is done for them, and if there is anything that is to be commended in our work it is minor gynecology, which promises to do away with many of the more serious diseases, if the cases are attended to promptly, that would result fatally if permitted to continue.

I have had quite a number of these cases in the earlier part of my work, where dilatation and curettement were resorted to, and I unfortunately promised one patient that this would cure her of all her ills. Here I made a mistake. She afterward had to have her uterus dilated, curetted, and packed a second time before a cure was effected. This case taught me a lesson. I never take into consideration any case of this kind now without explaining fully what may have to be done, and I make the statement that a second or even a third dilatation, with curettement, may have to be resorted to before the desired result can be obtained.

I have under my observation now a woman who is expected to be delivered the coming January. She has been a patient of mine off and on for four years. It has not been my lot to see a more aggravated case than this. Two dilatations were made and curettements. She was married about two years ago.

I am rather inclined to question the advisability of these patients wearing a plug, as suggested by the essayist. If thorough dilatation is made use of, with curettage, and the uterus packed firmly with gauze, to be removed in due course, even if it is to be repeated a second or third time, there is less risk attending those measures.

Possibly at the present time we are inclined to look more after the so-called brilliant operations than we are after minor gynecological procedures.

I want to congratulate the society on having so excellent a paper presented to it by Dr. Fry.

Dr. Virgil O. Hardon, of Atlanta, Ga.—It is true that abdominal operations are frequently brilliant in their performance and results; but there are some results obtained from minor

gynecological surgery that are equally brilliant, at least from the point of view of the patient, and I do not know of any operation of which this may be said more truthfully than this one for the relief of severe cases of dysmenorrhœa. For instance, a young girl or a young married woman may, perhaps, from the beginning of menstruation, suffer so severely at every monthly period that she is obliged to go to bed, and can only be relieved by large doses of morphine. From the stand-point of the patient it is certainly a brilliant result to relieve her from all that monthly suffering.

I fully agree with what Dr. Fry has said except in one point with reference to the plug. I have been dilating the cervix for dysmenorrhœa for a quarter of a century, and I have been getting as good results as those which he has described without the use of the plug. When I began to operate on these cases I did use a plug or drainage-tube, and I found that in many cases the patients would have more or less continuous elevation of temperature as long as these plugs were worn; and yet, I am sure, I was not deficient in my antiseptic precautions. I then abandoned the plug, and since that time (it being now about fifteen years since I gave up the use of the plug) my results have been good, and I am inclined to think much better so far as the after-comfort of my patients is concerned.

There is one other point in connection with this subject, of which I desire to speak, which was not brought out in the paper, and that is the association of sterility with dysmenorrhœa. There are a great many patients who have suffered with dysmenorrhœa of this type who marry and remain sterile for years in whom the operation of dilatation relieves the sterility at once. I have had a considerable number of such cases, and the results were doubly satisfactory to the patients in that they were not only relieved of their monthly pain, but bore children. This furnishes an additional motive for adopting this plan of treatment, because any other plan of treatment short of thorough dilatation of the cervix, even though it may relieve dysmenorrhœa, will not relieve the sterility, and this *desideratum* should be considered in married women as well as in unmarried women, the majority of whom contemplate matrimony at some future time. In dilating the cervix it has been my plan to dilate it thoroughly. The more thorough the dilatation the more permanent the results. We should not simply stretch the cervix a little,

but I believe there should be a certain amount of laceration of the circular muscular fibres. If this is done, the results will be more certain than those following moderate dilatation.

Dr. George Ben Johnston, of Richmond, Va.—I desire to congratulate the Association on the admirable presentation of this subject by Dr. Fry. It is very much more important to pay attention to matters of this sort than to devote ourselves so exclusively to the so-called larger affairs of surgery. A great many women, because they suffer in this fashion, and have not been relieved by the application of ordinary remedies, conceive the idea that they are incurable. Many of these patients, if allowed to go on untreated, are in danger of becoming habitual takers of drugs or stimulants. They resort to the use of opium in some form to relieve the intense suffering at the regularly recurring menstrual periods, or they imbibe freely of gin. Gin is a frequently used remedy, and enormous quantities of it are consumed during the time of the menstrual period. If a woman has a large ovarian or fibroid tumor which demands surgical intervention she is sure to seek surgical relief; but the common run of practitioners are satisfied to temporize with the class of people designated in the paper, and not to recommend a surgical procedure. Surgical procedure in such cases is of the highest importance, but to be successful it must be applied in an intelligent, rational, and skilful way—and surgical treatment in such cases may extend over a number of weeks. It is not a matter of a day or a week or so of treatment, but sometimes the treatment extends over a number of weeks. A mere dilatation of the cervix in such instances, packing with gauze, putting the patient to bed, and allowing her to remain there a week or ten days, and to get up without any further attention, will not cure her. Dilatation, in the first place, must be thorough. I would not go as far as Dr. Hardon does in recommending lacerating the muscular fibres, but the dilatation should be thoroughly but gently performed. If thorough dilatation is rapidly and quickly performed in five, ten, or fifteen minutes, it will be more complete, and the structures will not be subjected to the danger of laceration. When dilatation is completed, curettement should be done, chiefly because the obstructive form of dysmenorrhœa almost invariably produces an endometritis which is to be treated by a thorough curettement.

I do not use irrigation after curettement. I mop out the uterus with segments of gauze, putting in successive gauze tapes

or strips, and withdrawing them, until in this way the cavity is cleansed. After cleansing the cavity, the insertion of a tape of gauze, not tightly but sufficiently well filling the uterus to establish drainage, we accomplish everything that is necessary. If the gauze is tightly packed, it brings on pain, which is often severe, and may even require morphine or some other pain-relieving remedy to allay. The mere packing of the body of the uterus lightly is sufficient, and the cervical canal a little more firmly. After a couple of days the gauze tape is removed and another one is inserted. The treatment should not end here. I really believe that this is the beginning of the treatment. The dilatation must be kept up, and, in my opinion, it is best accomplished by dilators. This is best done before the menstrual period, and not after, as Dr. McRae, I believe, recommends. The best time to operate is immediately before the menstrual period, so that the menstrual period comes on about the time you are ready to remove the second packing of gauze. When that period has terminated, dilatation may be kept up with dilators or sounds at intervals of four or six days, taking great care that the dilatation shall be a little exaggerated when the next menstrual period approaches. If this is done for two or four menstrual periods, in my experience, the painful menstruation usually subsides, and the patient is practically cured.

Dr. Hardon referred to sterility. Of course, we know that many women are sterile. We take it for granted that many of them suffer from dysmenorrhœa, because married women are very often sterile. I have known a number of instances of married women who have been treated after the manner that has been described, and after a short time they have become impregnated, although they have been sterile for six or seven years. I think this method is one of the best for painful menstruation.

Dr. W. D. Haggard, Jr., of Nashville, Tenn.—The trouble with the old stem pessary after curetting was that it produced fever within two or three days after its introduction, and the instructions were always to take it out as soon as the patient had elevation of temperature. Unfortunately, by the time fever had occurred considerable infection took place, which rendered the patient's condition worse than the original symptom of dysmenorrhœa. The same thing occurs with the use of Wylie's plug and other drainage-plugs. I onee knew of a case of double vagina and double uterus in which both uteri were curetted, and

into which so-called drainage-tubes were introduced, and the woman had double pus-tubes as a result. I have become opposed to introducing any plug in these cases for draining the uterine cavity. I thought we had about discontinued the use of the stem pessary and the Wylie tube. If the condition of anteflexion is associated with an atrophic endometrium, and the dysmenorrhœa comes from faulty desquamation of the endometrium at the time of menstruation, giving rise to dysmenorrhœa. Frequently the complete anatomical removal of this atrophic endometrium will allow a new one to grow that will be healthy and "melt" away during menstruation without pain. After curettage in these cases I pack the uterus with gauze to distend it—it is usually undersized—not to drain it. It is clean and needs no drainage. When I attempt to drain the uterine cavity I do not pack the uterus, but simply insert a single strip of gauze. Even that becomes clogged with lymph in twelve or eighteen hours, and capillarity stops. Really, after thorough divulsion of the cervix, if the uterus is forward, it drains itself through the patulous cervix quite well enough. If the symptoms are sufficiently urgent to call for an operation, the wisest plan is to straighten the canal by Douglas' plastic operation, taking away a section of the posterior lip of the cervix, suturing, and making it straight again. I have found that to be efficient in those chronic cases of dysmenorrhœa associated with anteflexion and sterility in married women, and in some cases after two or three curettements, like the cases to which Dr. Fry has drawn our attention, had failed.

Another point: If these conditions give rise to sufficient discomfort to demand operation, why would it not be a good plan to artificially impregnate the uterus, as it is well known that the changes incident to pregnancy cure them. I know this is a subject we do not talk about very much, but I recall a woman who was successfully delivered of a lusty girl baby that was the result of an artificial impregnation; the mother had been sterile for eight years. She has just been delivered by one of my professional friends.

Dr. A. Vander Veer, of Albany, N. Y.—I congratulate Dr. Fry on presenting to the Association a subject that is of so much importance and one so well handled in his paper. I did think, until the last speaker arose and made his remarks, that perhaps I was the only one in the room who had a vivid recol-

lection of the early work of Dr. Sims in this direction, or was familiar with the chapter in his celebrated book on *Uterine Surgery*, in which he refers to artificial impregnation. The line of thought suggested, however, is one that is worthy of consideration, but how little has been done in that direction from that time up to the present. The gentlemen who have discussed this subject have presented all the points so clearly and so well that it is a pleasure to come in contact with men who are doing so much for the relief of a class of cases that cannot be relieved otherwise.

As I look back and remember my early efforts following Sims' directions as to incision, and endeavoring to drain the uterine canal in this way, and having my cases relapse, I, along with many others, was disappointed in my work. But when our technique was improved, and when we were able to take hold of these cases without fear of sepsis, and dilatation was practised, a procedure which I have done for many years, we were brought into a field of operative intervention that has yielded the most brilliant results. If you could get hold of these cases and become familiar with their histories after this line of treatment has been instituted, I am sure you will feel as well satisfied with this branch of our profession as you do of anything, in that we often relieve women of painful dysmenorrhœa, affording them as much comfort as would follow the removal of a large fibroid or some other major operation.

There are two or three points I would like to emphasize, and among them the time of operation. I always endeavor to select the period of operation immediately after the woman has ceased menstruating. Then, I am satisfied that these cases classify themselves. Take a number of women who exhibit a fine muscular development, and sometimes they suffer more than their sisters of the opposite make-up. Such patients, I am convinced, are materially benefited by thorough dilatation, and it is in these cases, in which there is very little endometritis, that I seldom find it necessary to do more than one curettement and make one dilatation. I have seen them do splendidly after such treatment. Furthermore, I have seen cases with hypertrophic elongated cervix, conical in shape, and when they marry they do not become pregnant; and I have had to do an amputation, not as Dudley describes it, but simply to amputate the anterior and posterior lips, bringing together the mucous membrane and a

portion of the vagina, in this way obtaining a free open outlet for the cervical canal.

We have to deal with another class of cases in which there is a flabby condition of the entire muscular system. These patients present themselves with large uteri. They present the characteristic condition of endometritis. Those are the cases I curette thoroughly, and I still use the washout curette, not quite so often as formerly. In these cases we get a certain amount of metritis. I mop out the uterine cavity with a strip of iodoform gauze, pack carefully and thoroughly, leave this in for a period of two or three days, when it is removed by the nurse and renewed. In ten days I pack the uterus again in the intermenstrual period. When that is removed, you will still be able to bring out more or less detritus peculiar to this form of endometritis which is present.

I speak of these practical considerations, and I really feel that the introduction of the drainage-plug could not have originated with Dr. Wylie. It is, without doubt, practically the same as the old intrauterine stem pessary, which did a lot of harm years ago, in my early days. I could not begin to recount the number of cases of salpingitis, pelvic peritonitis, and abscesses I have seen resulting from the use of intra-uterine pessaries years ago. It is the same thing now, and they undoubtedly cause infection in some cases. As Dr. McRae has said, the plug is very apt to cause elevation of temperature, and if we get the candid opinions of men who are using it, we know it does cause a temperature, and the physician is worried over what is going on.

This subject is one of great interest. These patients, as Dr. Johnston has said, are medicated for a long time until they get into a condition of invalidism, and really believe that they cannot be cured, whereas a simple operation, done at the proper time, will lift them out of a condition of ill-health, and in the course of six months or so they feel entirely different individuals, and some of them, when married, bear children, who would not do so were it not for the treatment they had previous to their marriage.

Dr. McRae.—I did not give the reason why I prefer not to introduce the sound just before menstruation in married women. These patients frequently become pregnant within the first month or two months after thorough dilatation, and I think there is

danger of causing abortion. That is the reason I do not introduce a sound before a menstrual period, but immediately after.

Dr. Fry (closing the discussion).—What led me to bring this subject up was, that last spring in Chicago a paper was read before the American Gynecological Society on painful menstruation, and I was surprised at the pessimistic views given by men of experience, men whom we look to as teachers of how to practice gynecology; and, on returning home, I read the remarks of those gentlemen in their text-books, in which, so far as I could judge, no thorough technique was carried out as to the treatment of dysmenorrhœa. My experience has been so utterly different from a great many operators in this line of work that I am frank to say there is nothing in gynecological surgery that has given me so much comfort and satisfaction as this treatment for dysmenorrhœa. I have more grateful patients from this method of treating this condition than, I should say, all other operations put together. I believe the cause of failure of these gentlemen is due to some fault in their technique; they did not do the operation thoroughly, and it cannot be successful unless it is thoroughly done. If it is successful when it is not thoroughly done the success is only temporary.

In regard to the best time to operate, I agree with Dr. Vander Veer that it is soon after the menstrual period, and not later, as Dr. Johnston states. In all of these cases we have endometritis; we have a condition in which there is not free drainage from the uterine cavity. There is always some residual menstrual blood left. A few drops remaining in the uterine cavity may set up endometritis. To correct that we must get permanent drainage.

In performing the operation, simple as it is, it is necessary to use absolute cleanliness and do as aseptic work as one would do in a case of laparotomy. In the first place, dilatation must be thorough. Simple dilatation, such as was referred to by Dr. McRae, will not be permanent; it may relieve the patient for five or six months, but there will be recurrence. The cervical canal should be thoroughly dilated. After that I would irrigate, but not with the ordinary irrigating-tube. I take a cervical speculum as large as will go in, and wash out the uterine cavity thoroughly through it; then pure carbolic acid is applied to the curetted endometrium. The uterus is then washed out a second time, the cervical speculum is removed, and the dilatation usually needs to be repeated, because after you have applied carbolic

acid to the uterus and washed it out with hot water you will find the sphincter muscles are contracted again. Then, I measure carefully the distance from the os to the fundus. Having done this, I select a tube which is one-half inch shorter than that distance, so that there will be no danger of touching the fundus of the uterus with it. It may require a little force to push the tube into the dilated cervical canal. As long as the uterus is kept in an anteverted position the plug will stay in. Before I use the pessary I would put gauze into the vagina, remove it in two or three days, then wash out the vagina, and put in a second piece of gauze, and take the plug out in six days. It is my practice now to leave the plug in from three to six weeks. I was led to do this from a remark made by Dr. Wylie. Some doctor, in reading about the use of this plug, instead of leaving it in six days, as was advised by Dr. Wylie, left it in six weeks, and he told him that no harm resulted from its retention that length of time. Dr. Wylie, therefore, tried the plan, and since then I have left the plug in from four to five or six weeks. I leave it until after the next menstrual period following the curettage. The patient is put to bed and kept there about three weeks. Occasionally I let these patients get up in two weeks, but generally three weeks. I think this is an important feature in the technique of the operation. There is a slot in the side of the plug which allows of sufficient drainage; it is for the purpose of keeping the canal open. Some cicatricial tissue forms around the plug at the site of constriction, and it keeps the canal open and establishes drainage.

There is no comparison between wearing this plug and an intra-uterine stem pessary for two reasons. At the time of the use of the intra-uterine stem pessary we knew little or nothing about asepsis, and patients became infected with it. I would not think of leaving this plug in a moment if the patient had any rise of temperature, a point referred by Dr. Hardon. During the three weeks the patients are kept in bed a regular temperature-chart is taken, morning and night, and if I see the slightest rise in temperature the plug is taken out. I consider gauze more dangerous than a plug. If you put gauze in and leave it for two or three days it will drain serum, but it does not drain clots or any pieces of endometrium that are scraped off. I have seen fever come on from the use of gauze in twenty-eight hours after curetting. I have seen patients with chills and

fever, and consequently had to remove the gauze on account of a septic condition having set in.

With reference to sterility, I agree with what has been said, that these patients are sterile, as a rule, and that the dilatation which cures the dysmenorrhœa often cures the sterility. The class of patients we are called upon to treat for dysmenorrhœa are generally young girls and young unmarried women.

I am very much obliged to the Fellows of the Association for the free discussion of my paper.

REPAIR OF A COMPLETE LACERATION OF THE PERINEUM IN A GIRL OF NINE YEARS, PRODUCED BY THE FINGER OF THE OBSTETRICIAN AT THE PATIENT'S BIRTH.

By H. A. Royster, M.D.,
Raleigh, N. C.

The following case is reported because of its extreme rarity and on account of the peculiar features attending it.

The patient was L. F., a well-nourished girl, aged nine years. At her birth in another State her perineum was torn completely through the rectovaginal septum, and the explanation of this occurrence is stated to be as follows: The child's grandfather, a very aged physician, acted as accoucheur. Owing, probably, to dimmed eyesight and infirmity, a breech presentation was evidently mistaken for a vertex position, and the obstetrician, introducing his finger into what he thought was the child's mouth, but which was really its vagina, exerted traction, and the result was a complete laceration of the baby's perineum.

No immediate harm came from the accident, and it was resolved not to attempt a restoration of the injured region until the girl was considerably older. During the fall of 1900 she came first under the observation of Dr. Hubert Haywood, who related the above facts and kindly referred the patient to me for operation.

The parts, on examination, showed a quantity of dense scar tissue. The tear extended into the vagina to the depth of half an inch, and the sphincter ends were plainly visible on either

side. No incontinence of feces had occurred. At Rex Hospital on November 15, 1900, under chloroform anæsthesia, a butterfly-shaped denudation was made in the vagina and the exposed edges of the rectum pared, taking pains to dissect out the torn sphincters. The rectal tear was then united with catgut sutures, which were tied inside the bowel and cut short. Silkworm-gut was used for closing the vaginal surfaces and bringing together the ends of the sphincter muscle. Perfect apposition was obtained and rigid asepsis observed in all the details of the technique. In spite of these precautions only partial success resulted, due to the fact that the patient's bowels became unmanageable just at the beginning of the operation and the denuded area was constantly and unavoidably bathed by a stream of feces. This unlooked-for disaster was brought about by faulty preparation of the patient before admission. A purgative had been administered the day before, and on the morning of the operation an enema was given, with the report that the bowels had been thoroughly emptied. The continual discharges were a source of much annoyance, but, having begun, it was judged best to complete the operation, accepting the risk of infection, and hoping for the best. However, at the end of two weeks it was found that the external sutures did not hold, though union of the upper part of the denuded tissue was secured.

A second operation was attempted April 18, 1901. The same method of procedure was employed, but modified to suit the changed relations. In view of the former experience, the child was prepared this time under direct personal supervision, and no fecal contamination occurred. The parts healed promptly, and the result is perfect.

After a somewhat extensive search no case parallel to this has been found in the literature of the subject. There are many instances of injury to the female perineum, both in children and in adults, exclusive of parturition. Usually these are produced by falling astride hard objects, by the act of coition, or by the goring of horned animals. But certainly cases like the one just related are not frequently heard of. The only

one resembling it is a case that occurred some years ago in the practice of R. L. Payne, now of Norfolk, Va., then residing in North Carolina. In this instance the primary operation was done, but the case, especially in its mode of production, bears so close a resemblance to the one herein reported that a description of it is taken from Dr. Payne's personal communication and quoted verbatim as a fitting close to this brief paper:

"A. B., aged four days, a well-developed female infant, with a lacerated perineum, the laceration extending through the sphincter ani. The mother of the baby stated that she had suffered a very tedious labor, the child presenting by the breech. She was attended in confinement by a midwife, who made frequent efforts to deliver the breech with her fingers, and during these efforts she evidently hooked a finger in the anus and tore through into the vagina. The laceration was dirty and had a glazed appearance. I curetted the whole surface with a sharp spoon and closed it with small silver wire sutures. No effort was made to suture the rectal tear separately, but the sutures were placed deeply. Good union resulted."

REPORT OF A CASE OF ANEURISM OF THE ABDOMINAL AORTA WHICH WAS TREATED BY INJECTIONS OF A SOLUTION OF GELATIN INTO THE INTERCELLULAR TISSUE, WITH MARKED BENEFICIAL RESULTS.

By Ennion G. Williams, M.D.,
Richmond, Va.

Susan L., mulatto, aged forty years, married, two children living, two miscarriages, and no history of specific disease. In childhood had diphtheria, whooping-cough, measles, and malaria.

I saw her first in September, 1900. She gave a history of discomfort and slight pain in abdomen in the summer of 1899, soon afterward followed by a small pulsating tumor in the epigastric region. She complained still of considerable pain and throbbing in abdomen. There was œdema of both legs. Just below the ensiform in the mid-line and slightly to the left was a rather firm pulsating expansile tumor, over which could be heard a marked systolic bruit. The patient's arteries, radial and temporal, were sclerotic. Systolic murmurs were heard at apex and at aortic and pulmonic spaces, more distinct at the base. There was no gastric or intestinal disturbance except constipation, and no albuminuria.

A year later, the 16th of last September, her condition had so far progressed that the tumor extended from the ensiform to within five centimetres of the umbilicus and laterally to the parasternal line and slightly beyond on the left side, producing

a marked visible elevation below and to the left of the ensiform. The systolic bruit was heard best over the tip of the ensiform and to a less degree over the rest of the tumor. The patient was very emaciated and had been confined to her bed most of the time during the preceding year, and constantly for the six weeks previous. The pain was so severe that morphine had to be taken regularly every day and night. On September 16th, the first injection of gelatin was made with an antitoxin syringe in the subcutaneous tissue beneath the breast. It consisted of ten cubic centimetres of a warmed aqueous solution containing 10 per cent. of gelatin and 2 per cent. of calcium chloride. The solution was prepared by adding the gelatin gradually to water just below the boiling-point and keeping the solution at a slow boil for ten minutes, then adding the calcium chloride and filtering. It was sterilized by exposure in a steam sterilizer for thirty minutes on three successive days. A hot-water bag was applied to the site of the injection until the swelling had entirely subsided, which in each instance occurred in from one to three days. On the 29th of September a similar injection was given. On October 7th, 15 c.c. of a solution containing 10 per cent. of gelatin only was given by injection in three places. This was absorbed by the next day. On October 15th, 20 c.c.; on October 21st, 15 c.c., and on November 4th, 20 c.c. of solution containing 5 per cent. of gelatin was used. The patient reports that in from one-half to two hours after each injection she had a chill, followed by high fever. I had no opportunity of seeing her until the next day after the injection when I found the temperature each time between 99° and 100°. A marked lessening of pain was noticed three days after the first injection. Now, seven weeks after the treatment was begun, the patient has so far improved that she says she has not felt so well for more than a year. There is no longer the continuous pain in the back and sides; she takes morphine only occasionally at night, and feels so strong that she spends much of the time out of bed attending to household duties. The aneurismal mass is much firmer and slightly

reduced in size. The bruit is decidedly less distinct and of a higher pitch.

Of course, I do not consider the patient cured; the persistence of the tumor shows that she is far from it. But her condition is changed from being one of apparent hopelessness and a life of intense suffering, and she is now almost free from pain, and is hopeful.

CLOSURE OF THE ABDOMINAL INCISION, WITH REMARKS UPON THE CAUSE AND PREVENTION OF VENTRAL HERNIA.

By I. S. Stone, M.D.,
Washington, D. C.

If the statistics of ventral hernia resulting from abdominal operations could be accurately tabulated we should be astonished at the aggregate number, and for obvious reasons.[1]

We are all operating for the relief of these unfortunate people, but, strangely enough, see comparatively few of our own cases. It is possible that such victims of our bad surgery often go to other surgeons to tell their tale of woe. Many women, however, never report their condition to the surgeon who operated; neither do they always go to another, but bear their affliction in silence, lest they be obliged to again undergo an operation.

We have reason to believe that the average surgeon has from 8 to 10 per cent. of his incisions become infected. The exceptionally careful man may have only 2, or perhaps 5 per cent. of such results. It is fair to assume that 0.5 or 1 per cent. of these cases result in ventral hernia. While most cases of ventral hernia are a result of wound infection, it is true that some cases occur in which there is not the least evidence that such an accident has happened. Some of these are doubtless due to imperfect or defective methods of closure,

[1] Dr. Bull saw fifty cases of ventral hernia in two years, many of which had followed operations for appendicitis, and it is fair to presume that a majority of these were to the right of the median line, over the cæcum. Nearly four hundred cases of ventral hernia were admitted to the Hospital for Ruptured and Crippled in New York in six years.

while others are due to an enteroptosis, which may overcome the best methods or the work of any surgeon. A majority of ventral herniæ are caused—

First. By wound infection resulting in loss of fatty and connective tissue, and consequent separation of wound surfaces.

Second. Improper wound coaptation or failure to unite corresponding wound surfaces.

Third. Enteroptosis, with pendulous abdomen.

Fourth. Accidents, such as severe vomiting during recovery or any violence sufficient to break one or more sutures. Loss of fat or cellular tissue must cause separation of wound surfaces. The extent of this separation depends upon the loss of tissue and the kind of material used to close the wound.

Any space between wound surfaces is temporarily filled with serum or pus, and this is replaced to some extent by granulation tissue. But a most important change in the relation of the wound surfaces occurs coincidently with loss of tissue from suppuration; the peritoneum is pressed outward between the muscles and possibly the fascia, and the first step toward the formation of a hernia has begun. In all ventral herniæ we find the peritoneum attached to the skin, with very little fascia between, and which no longer serves its purpose.

This reference to the formation of a hernia in any case with conditions favorable to perfect union is made with the intention of showing in contrast how easily a hernia may result where an imperfect or defective technique has been used. Given a thick abdominal wall, coaptation made with only a minimum of tissue embraced by a through-and-through transfixion suture, and we have a most favorable opportunity for a hernia to occur. Equally certain are we to find such results after layer sutures of poor material. If the patient vomit after anæsthesia, or if suppuration occurs, the intra-abdominal pressure will probably cause sufficient separation of the wound surfaces for a collection of serum to fill the

dead spaces thus formed, and to allow the introduction of a wedge of peritoneum which will keep the edges of the wound permanently separated.

The various methods of wound closure cannot be discussed here, and we will mention only two of those commonly used —*i. e.*, the "through-and-through" and the "buried suture" of absorbable material. These are equally satisfactory in competent hands, and either one leaves very little to be desired if we are absolutely sure of the perfect sterilization of all suture material. We have used both methods of closure with nearly equally satisfactory results, but prefer the "through-and-through" suture of silkworm-gut, because it takes less time to close the wound and because silkworm-gut is easier to sterilize. We nearly always add a few sutures of catgut in closing the fascia over the rectus, as we believe there is no other way to be sure that this important step in the operation has been accomplished.

In all wounds made in or near the median line below the umbilicus we find the peritoneum very loosely attached, and after dragging upon it during the time of operation we find excessively long flaps which may be removed with advantage. This long flap has probably been infected, and at least has suffered much from severely rough handling. It is quite possible that this infected or injured portion favors the formation of omental or intestinal adhesions. We believe these long flaps should be excised, and accordingly we remove a strip from each side, from two to three centimetres in width, according to the length of the wound and the requirements of the case.

If anyone will observe the appearance of this flap of peritoneum when the abdomen is opened for any reason a few days after operation, whether at the post-mortem or ante-mortem secondary operation, he will observe the discoloration and other indications which appear to call for the precaution here mentioned. Besides the necessarily poor circulation in the long flap, it is almost impossible to close the wound so that space is not left between the peritoneum and muscle for

FIG. 1.

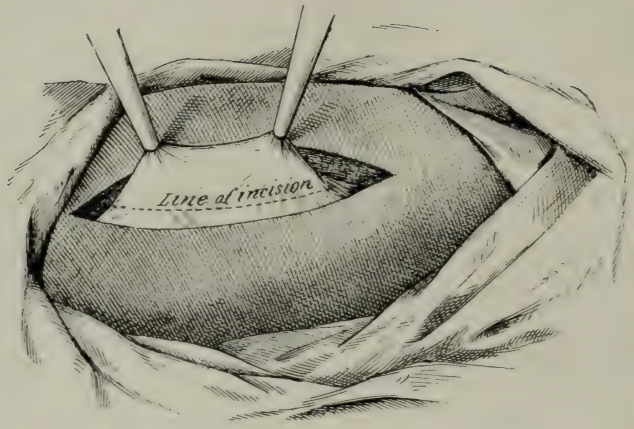
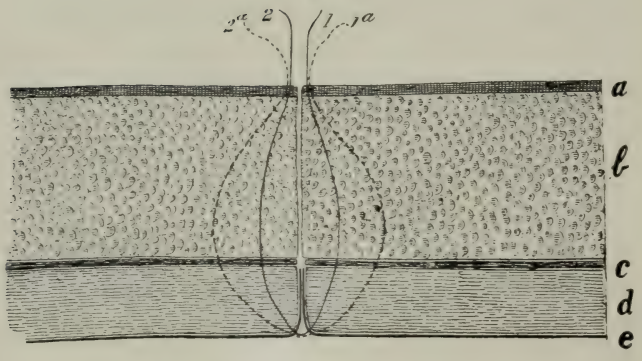


FIG. 2.



a. Skin *b*. Fat. *c*. Fascia. *d*. Muscle. *e*. Peritoneum.

the collection of serum or blood, which invites infection. Still another reason may be given for the suggestion: the mistake is often made of placing the sutures in such manner that a portion of peritoneum is fastened between the muscles. We advise the excision of the flap and the introduction of the sutures so that the peritoneum will come together, edge to edge, much as we would have after the operation for inguinal hernia.

1 and 2 (Fig. 2) show the wrong way to place an interrupted suture. The peritoneum is wedged between the muscle, and when traction is made at the skin surface, in tying, the distance between the skin and peritoneum is shortened, and pressure is made chiefly between these points or in line with the suture, thus paving the way for a ventral hernia.

1*a* and 2*a* (Fig. 2) show a better method of placing the suture. More pressure is made laterally, and all dead space is prevented. The peritoneal flaps are excised before the sutures are inserted.

In very fat subjects we suggest the use of a special suture, well known to some present, which can also be used in operations for ventral hernia. The object of this suture is to close the peritoneum, muscle, and fascia with pressure applied to these tissues, without including the fat or skin, and will enable us to remove the suture when necessary. To accomplish this a small silver tube[1] is used, through which the suture is passed, and which should be about as long as the fatty layer is deep.

It is my practice to leave these in place for at least three weeks. Some surgeons leave the thick fatty walls in such cases to heal by granulation, while others merely close the wound by means of adhesive strips. Neither of these methods appeal to us, however, as there can be no objection to any closure which brings the surfaces together without strangulation. The closure of the abdominal incision with silkworm-gut properly placed in each of the structures through

[1] This silver tube was brought to my attention by Dr. W. E. B. Davis, of Alabama. I am, however, unable to say who first used it.

which it is passed, answers every purpose that any other suture can serve, with the one exception that *it must be removed.* Since the introduction of this material, and its indorsement by Dr. Bantock and hundreds of his followers, no rival has appeared which can claim to approach it in value when properly used for surgical purposes.

I therefore suggest the following principles which should guide us in wound closure as next in importance to asepsis:

First. Remove all excess of peritoneal flap; also remove all loose pieces of muscle or fat, as these bits of tissue may become necrotic.

Second. Bring peritoneum, muscle, fascia, etc., together to meet similar tissues of the opposite side, without space between layers for collection of serum or blood, and yet without strangulation; the sutures to be placed in such manner as to make pressure as much upon the fascia, or tissues in the centre of the circle made by the suture, as at the peritoneal or skin surfaces.

The interrupted suture will answer these requirements in nearly every respect, the exception being its non-absorbability and also its inability to bring like surfaces together accurately. We use this method with entire satisfaction when supplemented by additional buried sutures, preferably of some absorbable material, in the fascia. Finally, I believe that layer sutures as generally used make unnecessary pressure upon the entire wound surface and prevent proper blood-supply, while they are not more effective in preventing dead spaces than the interrupted suture.

DISCUSSION.

Dr. Rufus B. Hall, of Cincinnati, Ohio.—I am very much interested in this paper regarding the closure of the abdominal incision, and indorse the statements made by the essayist, except one very important point. We are all agreed that if we wish to prevent hernia we must carry out the technique of closing the incision very carefully and along the lines laid down by him. I

believe there is an improvement over the technique suggested by him, inasmuch as we are all aware of the fact that if we bury catgut or tendon in the line of the abdominal incision we occasionally get just what we wish to avoid—pus. We know, too, that catgut will be taken care of in the peritoneal cavity readily, but when we bury it in the abdominal wall in these cases we are most likely to get hernia, particularly in fat subjects; say once in twenty or forty cases we get abscess. To avoid burying the catgut and still carrying out the idea of the essayist, of closing the peritoneum by closing the fascia perfectly as he does, with a suture that will keep it there as long as catgut will do so, will be a very important improvement over the technique, and this can be done very satisfactorily. We can keep it there for three weeks with silkworm-gut suture that can be removed as readily as can transverse sutures.

I will not take the time of the Association to go over the points of placing the sutures carefully, as suggested by the essayist, but I wish to illustrate diagrammatically my technique in closing the abdominal incision. [Dr. Hall then went to the blackboard and demonstrated his method of closing the abdominal incision.]

Dr. Charles P. Noble, of Philadelphia, Pa.—When Dr. Stone began to read his paper I thought he and I agreed very heartily, but before he was through we disagreed just as absolutely about some points. This subject is one in which I have been especially interested. In Philadelphia when I began doing abdominal surgery all surgeons closed the abdominal wound by the method which Dr. Stone has recommended, the through-and-through suture, with the exception of not using buried catgut sutures. The chief objection to this—which may be called the classical method—is the liability of hernia following its use. Dr. Stone objects to catgut when used by the layer method, because of the risk from infected catgut, yet by the method which he has recommended, of using a buried catgut suture between each of the through-and-through sutures, the wound is open to the same liability of infection from catgut. I know other surgeons who use through-and-through sutures, and use a whipped suture of catgut in the fascia to accomplish the same purpose. When I used through-and-through sutures I had about 10 per cent. of herniæ, and I do not think that is far off from the percentage one will get from that method of suture.

Practically all the stout women developed hernia. The percentage of herniæ was so large that I abandoned it.

For a number of years I used the tier suture, using silkworm-gut as the buried suture through the fascia, muscle, and peritoneum, and tied that so that the first row of sutures brought together peritoneum, muscle, and fascia. A second row was used with which to close the fat and skin. That method gave beautiful results. From the stand-point of infection with tier sutures I never had more than 2 per cent. of suppurations; with through-and-through sutures I had a much higher percentage of suppurations. Of a large number of cases in which silkworm-gut sutures have been used I only recall having suppuration in six or eight cases, and in those the stitches had to be removed. In the others I have never had to take out a stitch. Inquiries made in other hospitals revealed that none of them had to take out these stitches. I am satisfied one can get beautiful results not only in the matter of primary union, but in the prevention of hernia by that method. Of cases operated on in that way, one suppurative case developed hernia, and one umbilical hernia recurred. Some years ago, when I wrote a paper on this subject, I addressed all the men connected with the leading hospitals in Philadelphia, and asked them whether they had recurrences of hernia operated on by this method, and I find that the percentage of hernia is a fraction of 1 per cent.

For about six years I have been using chromicized catgut for the muscle and fascia and cumol catgut for the peritoneum and skin. By that method one woman who had a separation of the recti muscles at the time of the operation has developed a hernia. No other hernia is known. I am satisfied that with the tier method of using chromicized catgut the percentage of herniæ can be reduced to about *nil* or to a small fraction of 1 per cent., and with care suppuration can be reduced to the same extent. I have never seen but one case in which chromicized catgut came out. This patient had tubercular peritonitis; her vitality was very low, and some six or eight weeks after she reached home she had a little cold abscess, and a piece of chromicized catgut came out. That was the only experience I recall, so I am satisfied that if chromicized catgut is sterilized by boiling by the cumol method it gives no trouble.

As to one other point: Some years ago, feeling that I could get stronger union than by bringing the *edges* of fascia together,

I adopted the plan of lapping one fascia over on the other. I was led to do that on account of the popularity of the mattress suture—a suture in which the under-surfaces of the fasciæ are folded up against each other and held by the mattress suture. There is a mechanical disadvantage to that method. It seemed to me that if the two surfaces of the fascia were laid on top of each other we would get stronger union; they would overlap just about half as much, and union would be stronger. At first I used a special stitch of silkworm-gut with which to accomplish the union. After abandoning silkworm-gut stitches, in using catgut with the continuous suture it was simple to accomplish the same thing in a different way. With the continuous suture stitches passed through the fascia in this way upon one side, and then under the fascia on the other side, will draw the fascia of one side of the wound on top of that on the other. By first preparing the fascia on one side and separating it on the other side of the muscle you get a clean union of bare fascia to bare fascia. That is a method I have used for years with satisfaction. So far as my personal observation is concerned with the interrupted silkworm-gut stitch, the best results I could get were about 10 per cent. of herniæ; with the layer suture the percentage of herniæ is only a fraction of 1 per cent.

Another thing: I have had to operate on many cases of herniæ that have been previously operated on by other surgeons. They came from men who used the through-and-through stitch. I do not recall ever having operated for hernia following another surgeon who used the tier suture, so that I am positive of the advantages of the tier suture, and am an opponent of the other.

I quite agree with Dr. Stone about the question of suppuration. A large percentage of wounds that suppurate are followed by hernia.

Dr. J. Wesley Bovée, of Washington, D. C.—This is a subject to which I have devoted considerable time and earnest attention. I formerly used the through-and-through suture with bad results. The reason I had bad results from its use was possibly on account of my poor surgical technique, and probably on account of the sutures having been passed through the skin. We know the skin cannot be thoroughly sterilized, and that therefore when stitches are passed through the skin there is constant danger of infection travelling from the suture down through the tissues. This is particularly noticeable with silkworm-gut

in a needle of the larger size. The result is the possibility of an exudate along the track of the needle acting as a culture medium and allowing infection to spread from the skin downward.

Speaking of the through-and-through suture, the best way to avoid approximation of the (that is, lessening the distance between them) peritoneum and skin is to pass the suture in introducing it so that the greatest pressure made by it is laterally rather than antero-posteriorly. The pressure is greater from side to side than it is from peritoneum toward the skin, making it oval with the longest diameter of the fold transversely to the cut surfaces. This tends to throw it together from side to side, and aids materially in preventing shortening of the distance between the peritoneum and skin.

For a year and a half or more I have been using rubber gloves, as I think their use is an important part in the technique of this work. Of course, I am aware that many surgeons do not believe in the use of rubber gloves, but I think it is a marked feature in the technique of any part of our surgery in which they can be used, because it has been demonstrated repeatedly that we can infect suture materials by using them with bare hands. With the use of the rubber gloves we avoid that infection or contamination.

My method of closing incisions is this: If the incision is less than six inches in length, the peritoneum is closed by running a suture of medium-sized catgut, beginning at the upper end of the incision, whipping over the peritoneum all the way around when the suture is first passed in. I draw that up in a purse-string, which brings the peritoneal cut surfaces into one little bunch. This has one particular advantage, in that it lessens the area for the formation of adhesions on the inner side of the peritoneum. Now comes suturing which I consider very important, which is the closure of the lower portion of the sheath of the recti muscles. Of course, I am speaking now of incisions made in the median line. If you do not close this fascia when there is contraction of the abdominal muscles and diaphragm, such as you get in vomiting, there is pressure produced on the under-surface of the wound; if the fascia is not closed there is a tendency on the part of the peritoneum to bulge through the lower sheath of fascia. That is the beginning of hernia. I close that fascia very carefully with a layer of running catgut. Then I am careful to suture the next layer with kangaroo tendon, because

it has given me great satisfaction. I use kangaroo tendon for this layer because it is more durable than catgut. I have had two cases in which the incision gave way following operations by the use of catgut. I use kangaroo tendon for this layer, as I have said, and if the muscle on one side has been exposed a running suture of kangaroo tendon is made to pick up the fascia in the septum, lower on the solid side than it is where the muscles are exposed. That is done so as to hold the fascia down to prevent any serous exudate from resulting in that space—to prevent a dead space there. When I close the fascia with continuous kangaroo tendon sutures I close the fat with medium-sized catgut or fine catgut, and I do not care how many layers of catgut I put in the fat. I put it in loosely, so as not to produce tension or strangulation. I am sure to put that well in both ends, so you see there is no large space down to the end that is not sutured. This is brought up so that the fat is covered. I close the rest of the wound with subdermal catgut suture, tie it so that the knot is below the surface of the skin and does not show on the outside. Over that I put bichloride gauze, 1 : 1000, to absorb any material that may come from the incision—an antiseptic gauze which receives the material and tends to keep it in a sterile condition. Over that I put a collodion dressing which is not disturbed for about thirteen or fourteen days. The patient usually sits up on the fifteenth day. With this method of closure I have a less percentage of herniæ, and I have had less than 1 per cent. of suppuration following operations. It requires a careful technique to prevent suppuration. Most of my surgical work is in the pelvis and in dealing with pus in the pelvis, and I do not expect suppuration in any case after following the method described.

With reference to closing the fascia in the manner described by Dr. Hall, I have one objection, particularly to closing the fascia in that manner which requires the introduction of a special suture. He speaks of going from the outer surface of one side to the inner surface on the other side. In that way you do not get good approximation of the fascia, not as good as you do if you were to pass the suture through on one side from within outward, and going on the other side and passing it from without inward.

Dr. Hall.—I pass it from above down on one side, then bring it out and draw it from the under side up through.

Dr. Bovée.—I believe with this method of suturing we can get perfect results. We cannot put a suture through tissue like fat and expect it to hold firmly. It will not do so, because there is so much yielding; there is apt to be some separation of the main tissues which is not desirable in even the slightest degree.

Dr. Robert T. Morris, of New York City.—With reference to hernia following abdominal operations, it is difficult to determine the exact percentage of cases in which this occurs. If I have 5 or 10 per cent. of herniæ following these operations, the patients certainly do not come back to me. In one series of five hundred consecutive abdominal operations that I analyzed there were only four herniæ that I knew of. Many patients with herniæ following abdominal operation consult other surgeons rather than those who operated on them the first time. But if we leave the abdominal wall as we found it, or as nearly so as possible, there will be few post-operative herniæ.

For the skin, fat, muscles and peritoneum, I use simply prepared sterile catgut, which will become absorbed in about fourteen days. I put in a continuous suture through the peritoneum, catching the posterior sheaths of the recti muscles, then reversing and catching the anterior sheaths. That having been done, the muscles fail to yield or give. It fixes them. The next and very important point in the technique is to avoid putting any sutures through fat, because fat will run if it is liberated, and the hydrostatic pressure exerted by free fat is sufficient to cause a certain amount of burrowing. Therefore, do not put any sutures through fat, no matter how thick the abdominal wall. Atmospheric pressure will hold the fat much better, even if it is three or four inches thick, than any sutures that can be introduced. Atmospheric pressure will hold it evenly and nicely. For the skin (the only place where the staphylococcus albus is likely to enter) there is one weak point where the suture emerges, but the leucocytes usually head off the staphylococci which enter at that small point. My way of suturing the abdominal wall is simple. I claim no originality for it. This approximation of tissues leaves things about as you find them. The arrangement of structures was originally planned by the Lord. I thought it was a good suggestion, and adopted it.

Dr. Joseph Price, of Philadelphia.—It is interesting to observe the results of different methods of suturing and with the different materials that are used for closing the abdominal

incision. The profession is prone to change from one method of suturing to another, and in the past there has been too much of the *me* or *my* method of suturing, and men who did not believe in their early work—they had very many cases of herniæ following their operations—are now beginning to realize that herniæ follow abdominal operations more frequently than we have been led to believe. Patients coming from Europe to this country do not show herniæ. Clumsy methods were followed by surgeons in their early operative work, the various layers being sutured by the through-and-through plan with the Baker Brown or Peaslee ovariotomy needle. I have had two patients from Mr. Tait, one from Baker Brown, and two from Bantock. Hysterectomy was performed in three of the cases, and in the other two ovariotomy was done. One of the patients upon whom Baker Brown operated, when she was sixteen years of age, for the removal of an ovary, subsequently came to this country and bore three children. I operated on her for a laceration of the perineum. I examined the incision very carefully before and during operation under an anæsthetic. Union was good and the abdominal wall was as solid there as it was in other regions.

Two years ago I removed an ovarian cyst from a French teacher in Germantown from whom Mr. Tait had removed a large ovarian cyst some ten years previously. The cyst I removed developed on the opposite side, and I removed it. The cicatrix following the Tait operation was scarcely visible, and I am sure at that point the abdominal wall was stronger than at other points.

We fail to find cases of hernia following the operations of Priestly and other good old American operators, while we see many such cases now and have opportunities of studying the results. We know perfectly well that the results of the early work of operators by the through-and-through suture were bad; I mean by that, they had a mortality that they should not have had. They had stitch-hole abscess and hernia following their operations, which they do not have to-day with increased experience and better judgment. Closures are better done now, whether by the tier or through-and-through suture. Having used the through-and-through suture for a number of years, I find my results are very much better with that method and the percentage of herniæ less, and it remains less than at present by the tier method. Many cases of hernia come to me from men

who practice the tier method of suturing. I have now four patients in bed upon whom I have operated for large ventral herniæ. They were abandoned operations. The herniæ were enormous. I might say, briefly, that the class of patients predisposed to herniæ are the fat ones. The tier method of suturing favors the occurrence of hernia, and hence most of the cases of hernia that have come to me from other operators have been due to that plan of suturing.

Dr. Alexander Hugh Ferguson, of Chicago, Ill.—I cannot refrain from making a few remarks on this very interesting subject of closing the abdominal incision. We have all practised different methods of suturing from time to time.

A word regarding catgut. The size of the gut used is important—the smaller the strand the better. In the whole range of surgery I only employ the three smallest sizes I can get—Nos. 00, 0, and 1. Even in tying stout pedicles it is surprising how efficient a small strand is when other tissues are first crushed with forceps. In closing the abdominal wound in cases requiring no abdominal drainage the tier-suture method is the correct one to use. The old through-and-through suture properly inserted is in many instances the best; it is more rapidly done, and drainage may be established between the stitches without disturbing the whole wound. I not infrequently use both in combination. I have used the subcutaneous suture in every part of the body, and I do not think it is as satisfactory as the suture going through the skin, because the needle passes through the deeper glands—the sebaceous glands, the hair follicles, the sudoriferous glands, where the staphylococcus albus is likely to be present.

I do not recall having a case of hernia following an abdominal section for some years, and with our present improved methods in technique anyone who has eight or ten suppurative cases out of one hundred had better take a post-graduate course, because suppuration should not occur so often in good hands.

Dr. Stone (closing the discussion).—I have very little to say in closing the discussion. I wish to say, in regard to the work of Dr. Bovée, that he certainly has had excellent results. I asked the resident physician of the hospital where we do our surgical work about the percentage of infection, and he informed me that there was very little difference in the results obtained by Dr. Bovée in the last eighteen months or two years and that

of myself with the through-and-through suture. I have no reason to be dissatisfied with my work when I can operate on 100 or 200 cases and have but 1 or 2 per cent. of suppuration, because I know that is practically clean surgery. It is not the suture we pass through the skin that causes infection in the majority of instances, but it is the result of some infection in the wound that we cannot always prevent. The stitches are not responsible for a great deal of bad work. We generally blame the suture material for our bad results, when it is due to wound infection.

While I have mentioned this matter of Dr. Bovée and myself working side by side, and our results have been excellent, I do not want any of you to think that we can go on and continue to operate on 100 or 200 cases without having wound infection. I have corresponded with several members of the Association and those who are engaged in hospital work generally, and I must say, from what I have heard and from what Dr. Noble has claimed, that we must expect about 2 per cent. of wound infections in undrained cases. I have heard from other men who have made similar claims.

I want to indorse the remarks made by Dr. Ferguson when he said that a man who has 10 per cent. of wound infection, followed by suppuration in his operative work at this day and in this generation, needs to take a post-graduate course. Such a man had better cease operating and let someone else close his wounds for him.

MY FIRST ABDOMINAL SECTION.

By Thaddeus A. Reamy, M.D.,
Cincinnati, Ohio.

My first abdominal section was done in February, 1864. The patient, Mrs.——, resided one mile south of Zanesville, Ohio. The operation was done in her own house. The late Dr. Hildreth, of Zanesville, assisted. Chloroform was administered by Dr. A. E. Bell, the family physician.

The patient was sixty years of age, married, the mother of three children. The cyst removed proved to be multilocular, weighing, with contents, forty-six pounds. The incision was made in the median line, and five inches in length. Adhesions to the parietal peritoneum were extensive and at many points comparatively firm On their separation, which was done by the fingers, sponge, and handle of a scalpel, considerable and persistent hemorrhage supervened. Before attempting delivery of the tumor it was tapped with an ordinary trocar, patient turned upon her side in order to deliver the fluid into the vessel. The pedicle was ligated *en masse* by a heavy cord of shoemaker's thread (not silk). I here show a specimen which corresponds in size to the ligature used. The pedicle was divided with scissors and the tumor removed. One of the ligatures was cut short, the other long, in order that it might be left hanging out from the lower angle of the abdominal incision after the wound was closed. The hemorrhage from the fields of separated adhesions was now a source of solicitude. It had been but little controlled by the few small sponges which had been left gently pressing the denuded surfaces. Considerable blood had already accumulated in

the pelvic cavity. Cleaning this out the re-accumulation was too rapid for my mental comfort.

What could I do? The vessels were too small and too numerous to ligate, chemical styptics within the abdominal cavity were deemed quite unsafe. I had not the surgical experience nor the common-sense to pack with sponges or gauze so as to successfully compress the bleeding surfaces. The weather was cold, with an abundance of clean snow on the ground. I ordered some brought in. Compressing it with my hands into firm balls, it was held against the bleeding surfaces. The bottom of the pelvic cavity soon contained quantities of water from the melting snow, of course, mixed with blood. This was sponged out and the compression with snowballs continued. In a comparatively short time, to my delight, the hemorrhage ceased; then I dried the cavity with sponges and closed, without drainage, except what could be secured by the ligature already referred to, which was left protruding from the lower angle of the abdominal incision.

The abdominal incision was closed by through-and-through sutures of the same material and size as that used for ligating the pedicle. Ligatures and sutures corresponded exactly to those used by me in spaying sows when I was a farmer boy. By the way, the needle employed on this occasion likewise corresponded to that used in my work on sows.

It was four inches long, heavy as the largest sized darning-needle, gently curved toward the point and slightly flattened at the same end. The dressing consisted of a compress of gauze, several thicknesses, held in place by strips of adhesive, and over all a bandage. I remained with the patient day and night during the first four days, except that I was absent at my office two hours each morning. She was nursed by a daughter, who had had no training or experience. Comparatively little shock followed the operation. She vomited freely within four hours. This was not repeated. At no time did she suffer much pain. She was catheterized every six hours for three days, after which she voided her urine naturally. Twenty-four hours after operation pulse was 102.

No record of temperature. Administered by the mouth, 6 drops of Norwood's tr. virat. veride, repeated within four hours, but only in 2-drop doses. This remedy was continued every four hours for sixty hours, except when the patient was asleep. After the second dose pulse was reduced to 80. It did not rise above 80 during convalescence; much of this time it was below 70. All of this was by me at the time attributed to the influence of the veratrum. These were the days of my innocence and of undoubting faith in the potency of drugs. I had successfully warded off peritonitis.

On the second day after the operation the patient received 10 grains of calomel at a single dose, from which the bowels were freely evacuated. Gentle traction upon the pedicle ligature was made on the twelfth day and repeated each day thereafter until the sixteenth day, when it came away clean. The sutures from the abdominal wound were removed on the thirteenth day. Primary union complete, except at the point transmitting the long end of the pedicle ligature, and union here was firm within three days after its removal.

This woman survived the operation ten or twelve years, enjoying perfect health. No hernia.

This case serves chiefly, I think, to show the remarkable tenacity of life, the power to resist bad influences possessed by some constitutions. Think of snowballs in the peritoneal cavity!

It is questionable palliation for part of my work in this case that at the time it was done I had never witnessed an abdominal section. Nor did I witness one by another operator until after I had done twelve additional sections with three deaths and nine recoveries, leaving my record thirteen cases, with three deaths and ten recoveries.

Not an abdominal section was made, either in public or privately, by any member of the faculty of the Starling Medical College during my two years' attendance at the institution. Most of the work of this character done in Ohio and adjacent territory up until 1866 was by my friend Alexander Dunlap. Though a man of most genial nature, Dunlap

was not in the habit of inviting to witness his operations any one suspected of ambition in this direction. It may also be mentioned, as a matter of history known to those of us in a *position* to know, that at this time his work had a mortality of 35 per cent. Later he was able to reduce it to 25 per cent.

How wonderfully matters have changed under asepsis and improved technique! May I briefly compare some of my own more recent work with my earlier work. The results have certainly not been better than those secured by other operators equally favorably situated.

In my last series of one hundred cases of abdominal section for all causes the mortality was 6 per cent. In the preceding one hundred cases the mortality was 8 per cent. (three of these being bad pus cases). In the series of one hundred cases preceding this the mortality was 9 per cent. Excluding other conditions and selecting only cases of simple and compound ovarian tumors out of the three hundred cases above quoted, the mortality is but 2 per cent. In making my estimate of the value of the above experience it is proper to say that within the last six years, more than ever before, I have selected my cases. I decline operation on many cases, more especially those of far advanced malignant disease of the uterus, where others, not so conservative or timid as myself and more skilful, would operate.

The whole number of abdominal sections made by me within the thirty-seven years intervening since the case reported in this paper is 1600. This does not include 204 vaginal hysterectomies done by me, with 6 deaths and 198 recoveries from operation.

DISCUSSION.

Dr. Ernest S. Lewis, of New Orleans, La.—This interesting paper recalls my early experience as an operator. Like Dr. Reamy, I had never witnessed a gynecological operation. Abdominal sections in the city of New Orleans were exceedingly rare. Probably two or three ovarian tumors had been taken out, and columns of newspaper reports were published about

them. My first abdominal sections were made between 1873 and 1876, at the time when I became connected with the Tulane Medical College. The first case was that of a colored woman with a large multilocular cyst. Koeberle advocated a large incision, and I concluded by a large incision he meant opening the abdomen from the ensiform to the pubes, and his technique then was to thoroughly wipe the intestines and cleanse them. After removing the tumor by completely eviscerating the intestines I wiped the intestines, rubbed them dry, then returned them to the abdominal cavity, and closed the abdomen with a continuous suture. As Dr. Reamy remarked, it is astonishing the tenacity of life some women have. This woman recovered without any complication whatever. I became enthusiastic then about abdominal sections, and searched the Charity Hospital for another victim. I found another woman with a large ovarian tumor. I took no trouble to ascertain whether she had any organic disease of the heart, kidneys, or liver. I operated on her, and she did very well. I pursued the same technique. On the seventh or eighth day after the operation, while sitting up in bed taking some soup, she fell back and died without a struggle. An autopsy was held, and revealed Bright's disease in an advanced stage, with cirrhosis of the liver. From that time until now I think I have improved somewhat in my laparotomies.

Dr. Joseph Price, of Philadelphia.—The early results of operators have always been interesting. Some years ago I made a collection of the results of early operations in this country and elsewhere. McDowell's mortality was really low compared with the early operations done in Italy and throughout Europe and the Continent. The Italians had a fashion of calling each series a century, and in the early centuries the mortality ranged between 65 and 75 per cent. throughout Italy from these operations. In America and throughout Germany it ranged from 25 to 50 per cent. The mortality following the early work of Schroeder and Martin was high. Baker Brown reduced the mortality with the cautery to 24 per cent. Keith followed with cautery, and reduced the mortality to 2 per cent. It was a long time, however, before English operators reduced the mortality to so low a point as that mentioned by Dr. Reamy. In the late series of Knowsley Thornton at the Samaritan Hospital that I have any knowledge of the mortality was 11 per cent. Bantock got a mortality of 1 per cent. in 93 cases in one series. But in

this country McDowell's first, second, and third operations were successful. William Baynham did two sections in this State (Virginia) for ectopic pregnancy. Both women recovered. The first operation of John White Atlee was successfully done, and the woman recovered. The first case of Nathan R. Smith recovered; likewise the first case of Montgomery Walker. I might name a hundred American operators who saved their first cases of ovariotomy. I can think of two men—Howard and Mundé—who lost five cases each in their trial trips.

Taking the last series of 4 per cent., one of 6 per cent., and another of 9 per cent., it strikes me that Dr. Reamy should continue to do ovariotomies, and that many operators should send their cases to him instead of doing the work themselves. Only a few of the younger operators have reduced their mortality to 4 and 6 and 9 per cent.

Dr. Reamy (closing the discussion).—In referring to the work of Dunlap, it was not done for the purpose of casting the slightest reflection upon the great name of that pioneer in abdominal surgery. But it is known to those of us who were his friends that he never did accept until the last day, except in a general way, the ideas of asepsis. That is thoroughly known. It does not appear in the literature, and it is really marvellous, when this is considered, that he at last secured as favorable a mortality as 25 per cent.

Referring to my first case, the enormous size of the ligature used, the large size of the needle, and the fact that the sutures were inserted in closing the incision half an inch from the margin of the wound and carried directly through the peritoneum, including a large amount of tissue, so as to withstand more pressure without strangulating the tissue, may serve as an explanation for the non-occurrence of either hernia or suppuration. The fact that I had no suppuration in this case is really more marvellous than that my friend Dr. Dunlap only had 25 per cent. mortality from his operative work, because at that time such a thing as strict asepsis was unknown. We tried to be clean, and that is all. Furthermore, the snowballs in the abdominal cavity may have had something to do with the results. But they have not been tried by me since.

SOME OF THE AVOIDABLE CAUSES OF DISASTER IN APPENDICITIS WORK.

By Robert T. Morris, M.D.,
New York City.

If we step out upon the street and get ten healthy policemen, and put half a yard of gauze into the abdominal cavity of each one of them to-day, we shall probably find at the end of a week that "we did not get them in time." That is a statement that is often heard when we try to make weak and septic appendicitis patients bear what cannot be well borne by strong men.

If, in addition to the mechanical insult to the peritoneum that is offered by gauze packing, we add the chemical affront of iodoform, we should probably have still fewer of these policemen in time. Some of them would be likely to have symptoms that are commonly recognized as symptoms of septicæmia, and yet which are, in fact, symptoms also of insidious iodoform poisoning. The differential diagnosis between septicæmia and iodoform poisoning is not easily made; but there is testimony in the presence of iodoform in the wound, and of free iodine in the patient's urine, and frequently of a "healthy appearance" of the wound while the patient is failing. The latter point is one of considerable importance. In iodoform poisoning the wound is apt to look well, while the patient does not. In septicæmia neither the wound nor the patient looks well. A simple test for the presence of free iodine in the urine is to add a specimen of the urine to a pinch of calomel in a saucer. If the mixture is stirred with a splinter of wood a reaction occurs at

once, and the yellowish iodide of mercury that is formed gives testimony that must be taken into consideration.

Gauze packing in the peritoneal cavity has a tendency to cause or to continue the condition of shock. It thus lessens the patient's natural resistance, and with lessened resistance the patient is presumably not in the best condition for developing his phagocytes well. The surgical treatment of wounds at the present day includes the idea of calling to our aid to the fullest degree the blood cells which are known to combat infection. The production of such cells is a vital process, and presumably like other vital processes in this respect, that the better the general condition of the patient the better he is able to produce the phagocytic cells. If gauze packing lessens the patient's resistance, and if abundant and accessible statistics show that we can do away with gauze packing in appendicitis work, the employment of gauze packing may be classed as among the avoidable causes for disaster.

Extensive and multiple incisions lessen the patient's natural resistance, and must interfere with his production of phagocytes at a time when all of his protective resources need to be called into play and to be respected by the surgeon.

A beginner needs a great deal of room, at the patient's expense; but it is in the interest of the patient for one to learn as quickly as possible to work expeditiously, and by the sense of touch, through as small incisions as can be proven to be safe—in other words, to come as nearly as possible to leaving the patient alone. Another approach toward the idea of letting the patient alone consists in doing our work rapidly and with as little handling of the bowel as possible. Almost any appendicitis operation, no matter what the complications, may be completed in less than thirty minutes. Many a patient who is holding finely to his natural resistance at the end of fifteen minutes has lost it at the end of forty-five minutes, and the nearer we can come to completing an operation in the shorter period of time the more often shall we avoid the feature of a patient failing upon the table.

The idea that the surgeon must get all of the pus out of the peritoneal cavity is another cause for disaster. It is an old-time idea, good in its conception in earlier days, but based upon the belief that the responsibility of disposing of all of the pus rested upon the surgeon alone. Now we understand the lymphatics of the peritoneum and the action of the leucocytes in dealing with products of infection, and we can leave a good part of the work of cleaning the peritoneum to allies that do it better than we can if we do not rout our allies. In a case of progressing infection before operation the bacteria and the phagocyte cells are at warfare in a struggle for supremacy. The bacteria are winning, and they have stores of toxin in a large pus collection. If the surgeon turns out the greater part of the store of toxin it is remarkable to observe how quickly the phagocytes can take advantage of the situation and dispose of the remainder of the toxin if we aid them by conserving the strength of the patient. Mr. Tait arrived at a knowledge of this fact empirically, and his results were a cause of much concern to surgeons who were conscientiously giving much more scientific and painstaking attention to details of operative procedure than Mr. Tait gave. Now we are arriving at an understanding of the real reasons for his success. Quick and neat work minus asepsis was more effective than asepsis plus a long-drawn-out, painstaking operation which left the patient unable to bring out his protective blood cells to best advantage. If it were a matter of an alternative we might better employ Tait's methods to-day, but we can have asepsis and at the same time conserve the patient's natural resistance factors.

The most effective way for avoiding disaster in appendicitis work is for the surgeon to operate before the bacteria have done much operating in any given case. We often seem to overlook the fact that a patient is undergoing an operation during all of the time that bacteria are at work upon the appendix, so that it really comes to be a question as to who shall be allowed to operate, the bacteria or the surgeon.

DISCUSSION.

Dr. Samuel J. Mixter, of Boston, Mass.—I did not expect to be called upon to open the discussion on this paper. I have been very much interested in it, and I find there is very little to be said in opposition to the ideas advanced by the essayist. Speaking for myself, I am not quite as radically opposed to the use of gauze as Dr. Morris. Gauze is certainly abused, but it can be used with a great deal of advantage. In the use of gauze several things should be remembered, and one is that the harm it does can be greatly remedied by the additional use of rubber or gutta-percha tissue to surround it before we reach the point where it is necessary to use it. This removes many of the objections and dangers to the use of gauze.

I agree with him thoroughly in regard to what he says about iodoform gauze. I do not see the slightest advantage in using iodoform, and my reasons for not using it are both mechanical and chemical.

The question of how far we shall go in the removal of bacteria-bearing pus is a very important one, and although Dr. Morris expresses the matter in percentages, he does not tell us practically how far we must go. He says we must remove enough. Now, what one man considers enough another would consider insufficient. It is a matter that one has to acquire by personal experience, and through perhaps many disastrous failures. Personally, I believe in washing out to a moderate extent, but seldom in eviscerating, even if patients can stand it. Here let me say this, although it may seem something like the experience of Dr. Reamy with snowballs, that sterilized salt solution in an abdomen which is contaminated, or even warm tap water, is certainly better than no water at all, and I believe we can remove more germs than we put in.

Those are some of the points that occurred to me during the reading of the paper.

Dr. Edwin Ricketts, of Cincinnati, Ohio.—I simply want to bear out what Dr. Morris has said in regard to iodoform. I was unfortunate enough to have a death from the absorption of this drug, and I have long since ceased to make use of the same. I was very much pleased to note that my friend Dr. Morris, like many other men as they grow older in the work,

simplifies matters, and that, I think, is to be commended and not overlooked. I am well satisfied that the use of gauze in draining appendicial abscesses is overdone, and the illustration he gave us of the introduction of gauze into the abdominal wound of a healthy policeman is certainly one that we must not forget. The youngest case of appendicitis I have operated on was about five years of age. The patient was drained in the left inguinal region and median line, the sinus having been kept open for drainage, and, fortunately, recovered. Had I packed any one of the incisions with gauze I am sure I would have lost him.

In regard to washing out these abscesses, I think in many instances it is overdone, and I think we oftentimes put a patient on the right road to fight for his life by not flooding, as Dr. Morris has suggested.

Dr. A. Vander Veer, of Albany, N. Y.—I appreciate the kind invitation of the President to participate in this discussion. I have been listening to the papers this morning with a good deal of interest, and have been very much benefited by the remarks that have been made. The paper of Dr. Morris was an exceedingly interesting one to me. As I go over my work from year to year I find that I am getting nearer and nearer constantly to the great simplicity of the operations that I saw done by Mr. Tait in 1884. I saw him operate on a variety of cases, which we, at the present time, would look upon as disagreeable. I remember one case very well, in which he washed out a pelvis, containing quite an amount of pus, with considerable ease, and there was a gentleman present from Canada who kept asking Mr. Tait's assistant what chemical was used in the solution and what solution Mr. Tait used for his instruments. Mr. Tait did not allow much talking during an operation, and relied almost entirely upon himself and not very much upon his assistant in any of his operations. He quietly said to his assistant: "Stop answering him. When we get through I will reply to him." When the operation was over Mr. Tait referred to it. He said: "Doctor, here is a pitcher containing water used in washing out;" and he then turned to his assistant and asked him to give him a glass. This the assistant did, and he satisfied the gentleman from Canada that there was no chemical in the water whatever, but that it was absolutely pure water. This patient made a good recovery.

There was one point spoken of by Dr. Ricketts in referring to the paper of Dr. Morris which impressed me very much. Dr. Johnston and myself were speaking of it, and that is, we are coming nearer and nearer to the simplest methods possible. The man who succeeds in inventing an instrument of great value to the profession is the one who works at it constantly until he makes his instrument as perfect and as simple as possible. So in regard to operations in the class of cases that Dr. Morris has referred to, I believe there are few cases in which we are benefiting our patients by a thorough washing out. I abandoned that practice some time ago. I believe we can wipe out the lumbar region carefully; we can disengage the multiple abscesses in the small intestine and not eviscerate, but wipe out carefully and cautiously by inspecting through an incision of moderate size, and we can leave the patient in a better state to resist the bacterial condition that is developing to the injury of the patient. I believe we can leave the patient in a better condition by that procedure than by washing out too much and carrying infection somewhere else. At the same time I do not feel like giving up the use of gauze entirely. When I have a case with a long appendix that dips down in the pelvis, and the cavity is practically filled with pus, I feel like using drainage of some kind; yet I am coming to the use of plain, simple gauze drainage in the pelvis for twenty-four hours, so that this kind of drainage is in the direction of aiding the patient rather than causing any harm. I fully agree with Dr. Morris that we should bring the operation down to the simplest point possible, and do away with much of the packing that has been done in the past.

I am not prepared to add anything to the remarks made by Dr. Morris and those who have discussed his paper.

I will remark, however, that the fewer instruments we use and the less dressings we apply inside the peritoneal cavity the better. Operations should be done rapidly, with as little harm as possible. I am endeavoring to carry out and to live up to these things more and more every time I operate.

Dr. Alexander Hugh Ferguson, of Chicago, Ill.—I was very much pleased with the paper of Dr. Morris. It brings up the most advanced and the most practical points in connection with appendicitis work. I would like to draw his attention, however, to two varieties of leucocytosis. First, a general leu-

cocytosis, which we determine by an examination of the blood, and, second, a local leucocytosis, which occurs at the seat of operation and in the inflamed parts. Gauze may be introduced into the abdomen in such quantities as to distress the patient, obstruct the bowels, or increase the shock. But in suitable cases, where there is gangrene of the appendix, gangrene along the omentum or a portion of the bowel, or these parts are severely inflamed, drainage in different directions is called for down toward the edge of the omentum, into the pelvis, to the mesentery, and up toward the gall-bladder, between coils of bowel, gauze is applicable. I began by using a great deal of gauze, and every year I use less and less. I may come to the point of not using it at all. Iodoform gauze is better than plain gauze, for the reason that it fights the enemy *in situ*, and it irritates sufficiently to stimulate granulation tissue, and granulation tissue is the best fighter nature has. Therefore, I like to use iodoform gauze occasionally, but not to the extent of poisoning the patient.

With reference to drainage, I prefer in the great majority of cases to use a small tube. It makes no difference how small the tube is, it is better than gauze, because the fluid will find exit in the direction of the least resistance. I would not like to discard flushing altogether. I use a tube an inch or more in diameter, having a big funnel attached capable of holding half a pailful at a time, and use enough water to thoroughly cleanse the abdominal cavity. When the abscess is local I do not flush. In a few instances I have treated the abscess cavity with 95 per cent. carbolic acid and then mopped it out with alcohol.

Dr. Morris (closing the discussion).—In my paper I intended to be brief and pointed and to merely outline principles. In making rules we assume always that there are exceptions. I tried to outline the rules and principles in such a way that we might follow them.

With reference to the statement of Dr. Mixter regarding the use of gutta-percha, undoubtedly it obviates some of the dangers in the use of gauze. It avoids the formation of adhesions. There is not such extensive exudation of lymph which organizes; we do not get such extensive adhesions afterward, and it does modify markedly the bad effect of gauze. However, we can do away with almost all of our gauze packing. I know several surgeons who have done away with it. We used a great deal of

gauze—too much. I became interested in the Mikulicz method, and was at work in Hamburg at the time it became popular. I did a good deal of work there and used Mikulicz drains at that time. On my return to this country I told various New York surgeons how much I thought of those drains, and am now sorry that they had so much respect for my opinion. Gauze packing represented a transition stage, which was useful in its day, and represented, perhaps, the best knowledge we had at that time. But we have a better knowledge now in regard to the removal of septic fluids. I like to remove the amount of pus in an abscess which is in sight when I open the abscess. I do it quickly with peroxide of hydrogen, pouring it in in full strength, blowing out the pus. I use the peroxide of hydrogen not for its germicidal effect, but purely for a mechanical purpose. Practitioners tell me that it is a dangerous thing to use. Well, it depends on whether free exit is given to it. If peroxide of hydrogen is introduced into a cavity and free exit is not given to it, it is dangerous for the patient. We must give a free exit to such a powerful agent as peroxide of hydrogen. It blows out the pus in sight, and the leucocytes will care for the rest if we get into the patient's abdomen quickly and get out quickly. The principle is to leave our patients alone as nearly as possible. The quicker we can get in and out the better it is for the patient. Mr. Tait proved that. He used a great principle empirically.

Dr. Hall.—In a case of appendicial abscess, would you in every instance remove the appendix?

Dr. Morris.—That depends upon the condition of the patient. I recall two patients who were dead when I got to the house—and did not remove their appendices. I have gotten to others who were almost dead, with an irregular pulse of 150 or 160. In such cases I open the abdomen as quickly as I can, blow out what pus I can from the abscess as quickly as possible, and get out, leaving the patient in charge of his leucocytes and a good doctor. In a patient who has any considerable power of resistance left I would go to work and remove the appendix, no matter what the adhesions might be. I do not care about adhesions. We used to hear of inoperable cases on account of adhesions. Drs. Ferguson, Price, Mixter, and others have heard of inoperable cases on account of adhesions. There cannot be such a thing. There are no cases inoperable on account of adhesions, but there are cases in which patients are in such a low condition that it is wise

to leave their appendices and run. We can lay down principles and yet adhere to wisdom.

Dr. Watkins.—What would you do in a chronic case in which there is pus and a mass as thick as one's hand?

Dr. Morris.—I will answer the doctor's question by putting another. What becomes of the necrotic tissue or masses of lymph tissue that remain adherent to the bowel? I used to be afraid that these would decompose and poison the patient. But these masses are absorbed. I had to learn these things. I thought patients with such masses were going to die. I am not concerned very much if patients do die, provided I have done the right thing. I am not afraid to leave these masses of lymph —thick, gray, and white masses over the bowel. I have seen the bowel so thick and fragile with these masses that it would break almost like cheese. Those patients got along nicely, and absorbed all that lymph. I have lost my fear of such lymph, because it seems to undergo absorption rather than a dangerous kind of decomposition. The saprophytes will destroy it, but many saprophyte toxins are apparently not very dangerous to those patients.

Dr. Vander Veer spoke of the use of pure water by Mr. Tait. This indicates a point I have often made. We should also observe that Mr. Tait operated quickly; he did very little or no injury to his patient. He introduced a good many bacteria during his operations, but the patients were able to resist the invasions of these bacteria. Mr. Tait did not injure his patients very much himself. It is wonderful how patients recuperate if we do not injure them ourselves. He could introduce bacteria and all kinds of things with water from the tap, and yet the patients would resist and get well. Notwithstanding all this, he did not get as good results as he might have obtained with asepsis. If he had used asepsis how much nicer abdominal wounds he would have had, and how much more quickly his patients would have got out of bed. He could have done much better, but he taught us a first-rate lesson.

Dr. Ferguson spoke of the different forms of leucocytosis. In some cases we have no leucocytosis. I had two cases within the last two weeks of fulminating appendicitis. The patients were so overwhelmed that they could not manufacture phagocytes. They had no leucocytosis. The appendices were gangrenous. The

patients were paralyzed by the terrific blow of immediate infection, and could not resist. I washed out their abdominal cavities with salt solution, and thus let go the principle for the exception. They are both getting well. I made blood examinations, and found that leucocytosis began in one case in a few hours after we had washed out the abdominal cavity. I did not get a blood record of the other cases, but proper leucocytosis must have developed.

In cases in which we have gangrene of the omentum and bowel Dr. Ferguson thinks it is well to use gauze packing. Yes, occasionally we must use gauze packing in these cases. But the patients are not likely to do so well. It is the lesser horn of the dilemma, and we must occasionally use gauze packing, but not employ it as a rule, as is so often done in New York and other cities as a routine practice. Gauze packing is used, and even iodoform gauze is employed, and the statistics are bad, according to the reports of many of the hospitals where this is used. We are told that there are no other statistics. Such statements interfere with our progress. We must accept the good statistics of different men and look behind them for the reasons, and not say that a man who shocks his patients by committing taxidermy upon them is going to have just as good results as the man who leaves out the gauze.

As to the matter of one drachm of iodoform being required to poison a patient, I was called by one of our well-known surgeons to see a little girl at three o'clock in the morning. She was ten years of age. She was a strong, beautiful child. He had operated for appendicitis. He said that she did not have a badly infected appendix, and yet the girl was dying. The wound looked well. There was some iodoform gauze in the abdominal cavity because there had been some oozing from the meso-appendix. That was the reason why it was used. The little girl did not have a drachm of iodoform in her abdominal cavity, but she was one of those patients who are peculiarly susceptible to its influence. She had an idiosyncrasy for it, and she was poisoned quickly by it. In other words, she was being killed by the iodoform. She died that night. He told me that it was a lesson to him. We can sometimes use iodoform gauze if we watch our patients carefully. It is important to use gutta-percha tissue about the gauze. I use this regularly for my small drains in the

cases that must have drainage. I am gradually giving up drainage, but I still drain in some cases. I use a capillary drain composed of a roll of gauze not much larger than a lead-pencil, rolled in gutta-percha. This avoids adhesions to the bowels; it drains along the margins as well as through the gauze. This cigarette drain is the drain I use in place of gauze packing.

THE RESULTS OBTAINED IN SIXTY OPERATIONS FOR PROSTATIC HYPERTROPHY. DEMONSTRATION OF A NEW COMBINED ELECTRO-CAUTERY INCISOR.

By Hugh H. Young, M.D.,
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There is no question in modern surgery which has been the subject of more discussion than the treatment of prostatic hypertrophy. Only eighteen years ago the unfortunate sufferer with this malady could alone gain relief from his miserable condition by the constant use of the catheter, and this was the treatment the world over. As long ago as 1876, Bottini described his galvano-cautery operation, and assured the world that prostatic hypertrophy could be successfully treated by its use; but his assertions were entirely lost sight of. About ten years after Bottini came the brilliant reports of Belfield and McGill, showing the possibility of successful and fairly easy removal of the enlarged prostate, and prostatectomy has become a very common procedure; but through recklessness the mortality has been high. Then, in 1893, came White, with his castration operation, showing that by this simple method a wonderful disappearance of the prostate could be obtained in all cases and a perfect cure effected. His operation spread like wildfire all over the world, and the sacrifice of healthy testicles was more tremendous than it had ever been with the corresponding organs in the opposite sex in the palmiest days of ovariotomy; but soon there was a reaction. Operators found that there was,

strangely, a considerable mortality, and that the results were far from being what had been expected. Then, in 1897, came Freudenberg with a marked improvement upon Bottini's apparatus and convincing articles showing the worth of the neglected cautery operation.

Various other procedures have been brought forward, but have had their day; and the question of choice has to-day narrowed down to a choice between the method of Bottini and the method of Belfield—prostatectomy.

It is high time, therefore, that we stop, look over our results, carefully examine our cases which have been operated upon for several years, and, if possible, determine as far as we can the advantages, the disadvantages, the limitations, and the possibilities of the two methods. With this idea in view the author has collected as carefully as possible his statistics on his own cases, and has endeavored to find out their condition at the present time; and the object of this paper is to compare the results he has obtained by the different methods. My cases, now amounting to 60 in number, are divided as follows: Prostatectomies, 15; Bottini operations, 40; miscellaneous, 5.

We shall first take up the 15 prostatectomies. In 12 the prostate was attacked through a suprapubic wound, and in 3 through a perineal wound. The ages of the cases were as follows: The oldest, sixty-seven years; between sixty-five and sixty-seven, 4; between sixty and sixty-five, 2; between fifty-five and sixty, 5; between fifty and fifty-five, 2; between forty-eight and fifty, 2. Their condition was as follows: Good in 10 cases, fair in 2 cases, and bad in 3. In 5 of the 15 one or more calculi were present in the bladder, and 6 had led catheter lives. In 7 cases the hypertrophy was very large, in 5 moderately large, and in 3 slight. In these 3 cases the lateral lobes were not enlarged, but there was present a small, pedunculated middle lobe. In 11 of the other 12 cases the lateral lobes formed the chief obstruction to urination, the median portion appearing generally as a transverse bar, and only three times as a small, rounded lobe.

In one case, however, there was tremendous intravesical tumor-growth of the middle lobe, 3 inches long, unassociated with enlargement of the lateral lobes.

In 11 of the 15 operations complete enucleation of the prostate was performed. In 4 the operation was partial, the obstructing part alone being enucleated (the middle lobe in 3 cases). The results obtained are as follows: 15 cases, no immediate deaths, two deaths one month after operation, one from uræmia and another from sepsis. In the first case autopsy showed a marked double pyonephrosis, and the patient was undoubtedly too sick a man for prostatectomy. Simple drainage of the bladder might have saved his life, or he might have lived after a Bottini; but prostatectomy was too severe an operation for him. The second case developed an extensive inflammation of the left breast at the site of a subcutaneous infusion which was given after the operation, and the patient died of general septicæmia and uræmia. He had at the same time a very severe inflammation of the bladder, and it is impossible to say how much that contributed to his general septicæmia. It is hardly fair, however, to attribute his death to the operation. One case died, about a year after the operation, of carcinoma, which had ulcerated into the bowel, causing a vesicorectal fistula. The extreme nodular and indurated character of the prostate made me suspicious of carcinoma at the operation, and subsequent events proved this to be correct.

Of the 12 cases that have lived the condition of all is vastly improved, and practically all of them consider themselves cured; but in 2 instances the interval between urinations is from two to three hours. There is still some cystitis present in most of the cases. In all of them, however, as far as the prostate is concerned, the condition may be classed as a cure, cystitis and slight contracture of the bladder being responsible for the only symptoms present. I have, unfortunately, been unable to examine but few of the cases for residual urine, but all think that they can empty their bladders. In 12 cases periods of six months to three and

a half years have elapsed since the operation. Of these 1 is dead (see above), 1 not heard from. The other 10 are cured as to the prostate—*i. e.*, have no obstruction to urination and very little residual urine; 2 of these suffer from slight contracture of the bladder and cystitis.

The one more recent case—now four months since the operation—is completely relieved, has no residual urine, and voids about every three or four hours.

Taking the Bottini operations, 40 in number, 6 have not been followed, leaving 34 operations done upon 31 patients, 3 patients having had two operations each. Their ages were as follows: Over eighty years of age, 3 (2 cured and 1 improved); between seventy-five and eighty, 3 (all cured); between seventy and seventy-five, 9; between sixty-five and seventy, 6; between sixty and sixty-five, 6; between fifty-five and sixty, 4; 18 cases were over sixty-seven years of age, while none of the prostatectomies were over sixty-seven. The condition was good in 9, fair in 10, poor in 6, and bad in 6. Among the 34 operative cases there were 3 deaths, all in patients under seventy years of age, and all in bad condition; 2 died from uræmia, respectively four and five weeks after the operation, and 1 from sepsis two weeks after the operation.

In this third case (which was also in bad condition) the death was apparently caused by the fact that one of the cautery incisions, which were $4\frac{1}{2}$ cm. long, penetrated beyond the capsule of the prostate and led to the formation of a small periprostatic abscess, followed by septicæmia. In none of the other cases was the operative technique responsible for the death. Of the 31 patients 13 had led catheter lives varying from one to fourteen years in duration. All of these but one have been able since the operation to void without a catheter; one uses the catheter occasionally, and in the other the urine comes through the suprapubic opening. Calculus was present in 9 of the 31 cases, and in every case the stone was removed by litholapaxy, in one patient, aged eighty-two years, nineteen stones being removed.

The character of prostatic enlargement, as determined by cystoscopic examination, in the 31 cases was as follows: Hypertrophy of only one lateral lobe, 1; of one lateral and median bar, 3; both lateral, 3; both lateral and median portion, 6; median portion alone (after castration), 1; both lateral and median lobe, 5; small sclerotic prostates, 2. Classified as to the size: 17 were large, 8 medium, and 6 small.

Results: In figuring the results considerable attention has to be paid to previous cystitis and contracture of the bladder, as either of these may produce a frequency of urination and lead one to consider the operation a failure. I have, unfortunately, been unable to examine the urine of many of my cases, but I know that cystitis persists in 16 cases, though, generally, in a much more moderate form than before operation. Contracture of the bladder is present in 10 cases, but only in moderate degree. In 2 cases a peculiar irritability of the bladder, unassociated with cystitis or contracture, persists, and I am completely at a loss to explain its presence. In 2 cases there is more or less incontinence of urine. In both of these cases the prostate was only slightly hypertrophied, and, although the incisions were short, complete continence has never been regained. Deducting the 3 cases that died, 28 remain, and of these 20 are not of recent date and heard from. Of these 17 are cured, two are improved, and 1 unimproved; 8 are too recent or not heard from. All the recent cases, however, furnish a good prospect for cure. As regards the general condition of the 28 cases, all are greatly bettered, with the exception of 2 cases in which incontinence persists, and in these there is great relief afforded by the removal of the hinderance to urination.

As shown above, the results obtained by the Bottini operation have been splendid. The instrument used in the first half of my cases was Freudenberg's. During the past year I have made use of a special instrument, which I shall take this opportunity to describe in detail, but before doing so will give the reasons which led to its construction.

Although the electro-cautery operation was brought out by Bottini as far back as 1876, it was not generally adopted until 1897, when Freudenberg presented to the profession a greatly improved instrument, and followed it up by numerous convincing articles. During the past four years this operation has been performed very extensively, and we are now in a position to stop a moment, look over our results, and discuss the shortcomings of the operation as well as its merits.

Freudenberg's large collection of operated cases probably show very accurately the value of the procedure. The statistics are as follows: 752 cases, in which the result was good in 86.5 per cent., a failure in 7.5 per cent., and the mortality between 4 and 6 per cent.

These figures, if correct, undoubtedly show much better results than can be claimed for any other operative procedure. Castration, while peculiarly effective in a certain class of cases, has been wofully unsatisfactory as a routine procedure, and has justly been relegated to the list of operations historically interesting, but practically valueless.

Prostatectomy, thoroughly performed, is undoubtedly an operation of great value. There is no question that the statistics as to the value of this operation are entirely misleading, for many reasons: first, because in most of the recorded cases (and all until recently) the operation was entirely inadequate —merely a nipping off of the most evident intravesical projections, leaving the equally important points of compression in the deep urethra untouched. There is no question, however, that a thorough removal of the entire gland, which can be generally easily accomplished by enucleation with the finger, is a very successful operation, and entirely satisfactory when perfectly accomplished.

There are, however, several varieties of prostate which are unsuitable for this operation, principally the small and the sclerotic varieties. This, however, is not the principal objection, but the fact that in the majority of instances we are confronted with patients too old and too feeble to safely

undergo the shock of a satisfactory prostatectomy. It is for just this class of cases that the Bottini operation has proved such a blessing and achieved really wonderful results. On account of the success of the cautery operations in the otherwise hopeless cases, it has become more and more the question whether it should not become the method of choice in all manner of cases. Since there are, however, a certain number of failures (7 per cent. or more) and a certain mortality (between 4 and 6 per cent.) shown by the Bottini operation, it still remains questionable whether it should replace prostatectomy, especially in younger patients. To settle this point, more extended investigation is necessary. It also behooves us to study the causes of failure and fatality in the Bottini operation, with a view of finding means of obviating both as far as possible.

Among the causes of death besides uræmia, shock, sepsis, etc. (presumably unavoidable), we find recorded several unavoidable reasons, principally improperly placed or too lengthy incisions. In the first category are deaths from the cautery blade burning its way into the rectum, due, as has been shown by Freudenberg, to the fact that the beak of the instrument became caught in a postureteral pouch, which is separated by only a short space from the rectum. In the same class are those fatal cases in which the entirely useless anterior cut was made and penetrated (as might have been expected) into the space of Retzius. In the second category are a number of cases in which the operator has rashly made his incisions too long, resulting in the rupture of the urethra in front of the prostate, and sometimes fatal hemorrhage from division of perineal vessels.

The statement of certain writers that incisions of $4\frac{1}{2}$, 5, or 6 cm. in length were often necessary to remove the obstruction is absolutely without pathological substantiation, and undoubtedly liable to lead to a great many serious blunders by the profession. Very rarely, even in the largest hypertrophies, should an incision over $3\frac{1}{2}$ cm. or 4 cm. be made, first, because it is unnecessary, and, secondly, because it is

dangerous. Death from any of the causes outlined above is preventable, and should in the future be eliminated from the statistics.

In Freudenberg's statistics, after excluding the fatal cases (4.2 per cent.), we find 92 per cent. improved, 55 per cent. cured, 37 per cent. definitely improved, and 8 per cent. failures. Why should there not be a greater uniformity of results? Is it the operative technique or the instrument that is at fault? Turning to the instrument, we find the one of Freudenberg much preferable to that of Bottini, as has been very frequently pointed out; but there are several very evident weaknesses in even the former instrument. In the first place, since there is the very greatest difference as to size, shape, and condition in hypertrophied prostates, it is unreasonable to expect one single cautery blade to be suitable for all. An incision which is plenty deep for a medium-sized hypertrophy may be wholly inadequate for a very large one, and positively dangerous for the small fibroid forms. Then, again, one lobe is often very greatly enlarged, while another is only slightly so. Are we then to give each the same depth of cautery incision? I have in my collection of autopsy specimens several prostates with small but very obstructive middle-lobe enlargements, where the ordinary Freudenberg and Bottini instruments would have penetrated beyond the capsule, and, perhaps, into the rectum. It is very evident then that an instrument with several easily interchangeable blades of graded sizes would be a decided improvement.

There are two other defects in Freudenberg's apparatus, which, while apparently trivial, are of considerable importance. The first is in the shape of the beak of the instrument as now constructed. The traction necessary to hold the beak up against the prostate during an operation will often pull it into the urethra. This is due to the fact that the beak meets the shaft at such a wide angle (or at such a slope) that even moderate traction causes it to ride over a median bar (for example) and slip into the prostatic urethra. The dangers of this accident are not small; indeed, it has occurred several

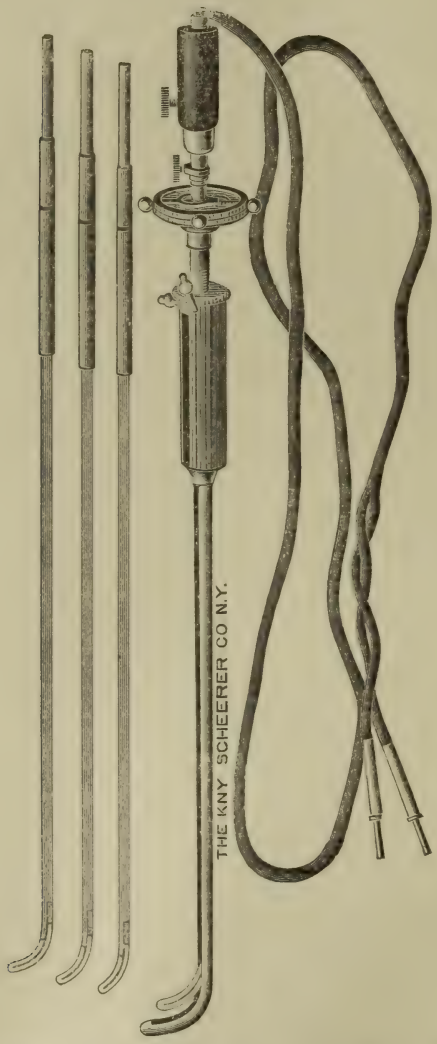
times, and has been responsible for several deaths, the cause being division of the membranous urethra, extravasation, hemorrhage, etc. In order to be certain that the beak of the instrument is against the prostate, and has not slipped into the urethra, Freudenberg has wisely advised that a finger be inserted into the rectum to determine its location before an incision is begun.

I have carefully followed this practice for the past two years, and have thus prevented several accidents ; for in numerous instances I have found that a little steady traction (as in an operation) would draw the beak into the urethra. But this safeguard is not always sufficiently accurate, for while it is comparatively easy to feel the tip of the instrument turned downward toward the trigone, one cannot often feel the beak with sufficient certainty when the instrument is turned to make a lateral cut, as one of my own cases demonstrated to my sorrow, viz. : Freudenberg's instrument was being used, the forefinger of the right hand was inserted into the rectum, and the tip of the beak definitely located to be in the bladder. The rotation was made for a lateral cut, and with the finger still in the rectum traction put upon the instrument to draw the beak up snugly against the prostate. The beak was not felt to slip into the urethra, but before beginning the cautery incision another careful examination with the finger (which was kept in the rectum during the entire operation) was made and did not reveal any slipping of the beak. Despite all these precautions (which happened to be unusually carefully taken in this case) an incision of 3½ cm. was followed by a gush of arterial blood from the meatus, and a perineal section done under cocaine revealed a ruptured membranous urethra and extravasated blood behind the triangular ligament. The timely operation saved his life, but it brought very forcibly to my mind the need of a beak which would not slip into the urethra, one more nearly at right angles to the shaft.

The other, at times quite disagreeable defect, was that the handle of the instrument would often become so greatly heated as to burn the hand of the operator and sometimes to

prevent his turning the contact screw to break the electrical current. Examination soon showed that this was due to bad

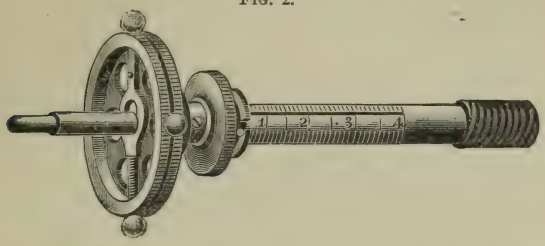
Fig. 1.



contact. This connection was made by a flat surface coming against a cylinder, resulting in a linear contact insufficient

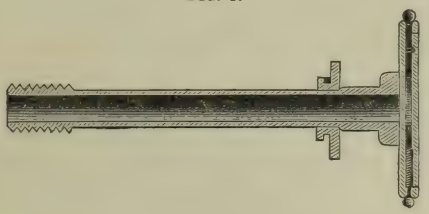
to conduct the high current necessary to heat the instrument without itself getting hot. This defect, while merely one of mechanical construction and easily remediable by bringing broader areas into contact, was one which frequently led to

FIG. 2.



great trouble both on account of the heating of the handle and the insufficiency of the electrical current which reached the cautery knife.

FIG. 3.



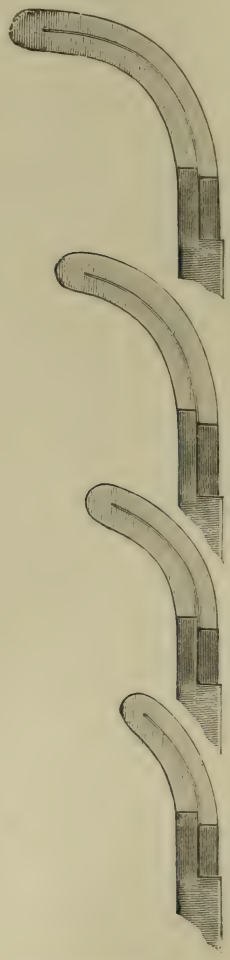
Recognizing more and more during two years' work with Freudenberg's instrument the drawbacks referred to, and especially feeling the need of blades of different size, the

FIG. 4.

writer finally began negotiations with The Kny-Scheerer Co., of New York, during April, 1901, for the construction of an instrument which would, if possible, fill all the requirements. After considerable experimentation, we have pro-

duced, we believe, a very satisfactory instrument, the construction of which is very thoroughly explained by the accompanying cuts.

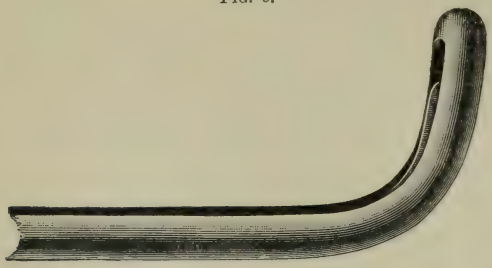
FIG. 5.



As seen in the illustrations, the form of Freudenberg's instrument is adhered to (Fig. 1), the only changes being in its having four interchangeable blades, a beak of different angle, connecting the handle with more extensive contact surfaces, and a few minor changes in construction.

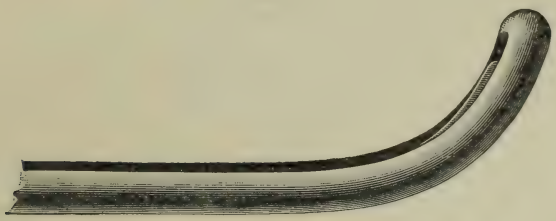
By a very simple device the simple elevation of a sliding bar on the rotary wheel, one blade may be removed and another inserted (Figs. 2 and 3). The sliding bar working

FIG. 6.



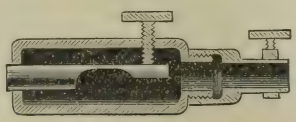
on a spring holds the blades firmly attached to the screw mechanism by engaging the slot near its outer end. We have had four blades constructed, as shown in the cut; the

FIG. 7.



smallest having an elevation of 0.8 cm., the second 1.2 cm., the third 1.7 cm., and the fourth 2.1 cm. Blade No. 3 corresponds to the one usually found in Freudenberg's

FIG. 8.



instrument, and is the one most generally used; while No. 2 is useful in small hypertrophies, and No. 4 for the very large. Blade No. 1 was constructed mainly to complete the set, and

without any idea of much practical value. I have been surprised, however, to find it very useful in several cases which will be given in detail further on.

The change in the shape of the beak has been of very great comfort. With the new beak (Fig. 6) it is impossible, with the outward traction which is put upon the instrument during the operation, for it to slip by the prostatic orifice into the urethra, whereas with the Freudenberg instrument (Fig.7) one has to be constantly on his guard lest this occur. The right-angled character of the beak does not make it any harder to introduce; in fact, it seems to ride over a high median bar with greater ease, having more the shape of a prostatic catheter.

The changes made in the attachment handle of the conducting cable, as shown in the diagram, consists merely in bringing larger surfaces in closer contact. To accomplish this we have placed beneath the end of the contact-making thumbscrew a metal spring having on its end a concave contact block (Fig. 8) made to fit the circumference of the end of the male blade. Another thumbscrew has been placed at the end of the handle to insure tighter contact at the other connection. These changes have completely done away with the disagreeable overheating of the contact screw which constantly occurred before, and which was undoubtedly due to insufficient contact as described above.

During the past five months I have used this instrument on sixteen cases, and have amply proved it to be practical, and one, I think, that has overcome many of the defects to be found in Freudenberg's instrument. We will give in abstract a few illustrative cases, but before so doing it may be well to state the measures we take to determine before operation the size, the shape, and the character of the prostatic enlargement, and the consequent selection of the blade to be used, and the length of the cuts.

Besides a systematic physical examination, noting particularly the condition of the arteries, a very careful local examination is made as follows: Rectal examination, noting the

size, shape, and consistence of the prostate; the relative enlargement of the two lobes, the thickness of the prostate as revealed by the finger in the rectum and a sound in the urethra (determining in this way the thickness of hypertrophy in the median portion); the adnexa of the prostate, vesicles, glands, rectal mucosa, etc.

Bladder examination: 1. With catheter, noting the location, depth, and character of prostatic obstruction; the residual urine, the capacity of the bladder, and its tonicity. 2. With cystoscope noting (*a*) the shape, size, location, and character of intravesical prostatic hypertrophy (especially as to the condition of the median furrow, whether a bar, or a rounded or pedunculated lobe, and its elevation above the trigone —*bas-fond*); the relative enlargement of the lateral lobes, etc.; (*b*) the condition of the bladder wall, as to trabeculation, pouch formation, diverticula, inflammation, ulcers, calculi, etc. 3. With searcher (in absence of a cystoscope), which, by rotary movements, may determine quite accurately the presence of a middle lobe and the relative size of the lateral lobes, as also the presence of trabeculation, pouches, etc.

Urinary examination, especially with reference to the character of the infection, besides the ordinary tests.

Having thus determined as accurately as possible the conditions present, a plan of action is mapped out as to whether a Bottini operation or a prostatectomy be preferable, and if the former, what blade should be chosen, in what directions cuts should be made, and what should be their length.

The following cases, including several forms of hypertrophy, give in detail the operation found applicable in each, and length of blade chosen. They demonstrate, I think, the *raison d'être* of the new combined cautery incisor, and its practical value. The work with this instrument being of recent date unfortunately prevents our showing the ultimate result obtainable, as several months must generally elapse before the full effects of the operation are secured.

Case I.—J. N. M., aged seventy-one years, had been suffering with urinary trouble for four or five years. Dur-

ing this time urination became steadily more difficult and more frequent, until he now voids every one and a half hours night and day.

Examination showed a slight but definite enlargement of the prostate, which was much harder than normal, but not nodular. The cystoscope showed a small median transverse bar and slight intravesical projections from the lateral lobes, but there was really very little intravesical enlargement of the prostate. With a finger in the rectum a very small increase in thickness over the normal was felt between it and the instrument in the prostatic urethra. The bladder showed very definite effects of obstruction, viz.: considerable trabeculation and pouch formation, a residual urine of 90 c.c., and a capacity of only 250 c.c.

Remarks. We evidently had to deal with the so-called small sclerotic prostate furnishing moderate but definite obstruction and a bladder hypertrophied and somewhat contractured. The very slight enlargement and the small amount of prostatic tissue beneath the urethra made us afraid to use Freudenberg's instrument. A prostatectomy would have been impossible, and as the case appeared to be in need of the Bottini operation, we persuaded the patient to wait until the arrival of our new incisor, so that we might use a smaller blade.

On May 31, 1901, a Bottini operation was done with blade No. 2 of our instrument, which blade seemed to suit the case exactly. The cuts were made, one posterior 2 cm. long, and two lateral, right $2\frac{1}{2}$ cm., left 3 cm. at right angles to the posterior.

Instrument used at a high heat, time about 1 cm. to the minute, and the operation done under control of a finger in the rectum. It was evident that a larger blade would probably have cut through the posterior capsule of the prostate. The convalescence of the patient was, as usual, difficult for the first few days, and after that a gradual improvement. The ultimate result was a complete relief of prostatic obstruction, micturition free, residual urine *nil.*

CASE II.—F. E. B., aged thirty-four years, presented himself on June 30, 1901, complaining of bladder trouble. The patient had had nocturnal incontinence of urine up to the age of fourteen, and after that he had always voided urine much too often. Seven years ago cystitis developed, and a calculus was discovered and removed by suprapubic cystotomy. The fistula did not heal till eight months afterward, and cystitis had persisted ever since. On admission he passed his urine about six times during the day, generally with pain referred to the neck of the bladder.

Examination. Patient was a rather neurotic young man. The urine was cloudy, acid, and contained phosphates, pus cells, and bacilli. The prostate by rectum was slightly enlarged and considerably indurated at the upper end of each lobe. A rubber catheter was passed into the bladder, but met some constriction of the prostatic orifice. The patient had just voided, but a residual urine of 220 c.c. was found. The bladder capacity was 500 c.c. The cystoscope showed a marked trabeculation of the bladder wall, a considerable thickening of the interureteral bar, and behind it a fairly deep pouch in which was a considerable collection of sand and calculi, white in color.

Examination of the prostatic orifice revealed a definite thickening of the median portion in the form of a transverse bar, and behind it a fairly deep *bas-fond*. There was no intravesical enlargement of the lateral lobes, but the entire prostatic orifice was irregular and showed numerous granulations.

Remarks. Although the patient was a young man, he had a definite enlargement of the median portion of the prostate, which was causing considerable obstruction to urination, as shown by the trabeculation and pouch formations in the bladder, and the presence of 200 c.c. residual urine. The prostatic enlargement, while probably inflammatory, was unquestionably causing trouble, and, in our opinion, demanded a Bottini operation. The prostate was, however, so small that it was out of the question to use the ordinary Freudenberg blade, so that the patient was asked to wait until our

instrument could be completed. In the meantime, he was put upon bladder irrigations and given urotropin internally.

On September 30, 1901, examination showed a considerable improvement in his cystitis, but the urine was still quite purulent. There were still 220 c.c. of residual urine present. Cystoscopic examination showed an improvement in the inflammation of the mucous membrane, and, much to our surprise, the considerable mass of gravel which was previously found had disappeared. There was still present the definite transverse median bar, with a pouch behind it, and the bladder wall was still trabeculated. Accordingly the Bottini operation was done, using blade No. 1, making a single posterior cut through the median bar 2 cm. in length. There was some hemorrhage following this cut. After the operation the patient experienced discomfort for a few days, but since then his condition has continued to improve. It was intended here to make three short cuts through the median bar with the small No. 1 blade, but the burning out of the fuse of the electrical connections in the hospital, after the first cut had been made, prevented the others being made.

Now, after two months have elapsed since the operation, his condition is much improved and the residual urine has dropped to 150 c.c. Unless this disappears soon we shall make the two other cuts through the median bar as originally intended.

Case III.—G. T. H., aged seventy-three years, was admitted September 9, 1901, complaining of prostatic hypertrophy and catheterism. Urinary difficulty began soon after the age of fifty, but did not get severe until about one year ago. About ten months ago he had to resort to a catheter, which he has used ever since. He now catheterizes himself regularly three times a day, and suffers very little discomfort, but the passage of the instrument is often quite difficult.

Examination. Prostate markedly enlarged, about the size of a large orange. Cystoscopic examination showed a very marked intravesical enlargement of the left lateral lobe and considerable enlargement of the median bar, and a lesser

enlargement of the right lateral lobe. There was a very deep *bas-fond* behind the prostate, and the bladder was very much trabeculated and inflamed.

A Bottini operation was done under chloroform, blade No. 3 being chosen. This blade is the same size as Freudenberg's. The posterior cut was 3¼ cm. long, right lateral cut 3¼ cm., left lateral cut 3½ cm. long. Hemorrhage moderate, and patient in splendid condition at the end of the operation.

The patient made a rapid convalescence, requiring catheterization three or four times after operation, and very soon began to void urine naturally. His condition since then has steadily improved, until now the interval between urinations is two hours during the day and longer at night. His general health has improved wonderfully, and he has gained twelve pounds in two months, and he is apparently going to get a good result.

CASE IV.—E. W. S., aged sixty-three years, was admitted September 13, 1901. Urinary trouble began four years before with difficulty and frequency of urination. For the past three months has had to use the catheter three times a day, and has not been able to pass any urine naturally.

Examination. Large, healthy-looking man. The rectal examination showed a very large hypertrophied prostate, left lobe apparently larger than the right, consistence firm, but not nodular. A rubber catheter entered the bladder with difficulty. The bladder tonicity was only moderately good, and the capacity about 500 c.c. The cystoscope showed a marked intravesical enlargement of the left lateral lobe, which projected into the bladder as a large rounded tumor, a moderate enlargement of the median portion, and a very slight enlargement of the right lateral lobe.

September 13, 1901. Bottini operation under cocaine and morphine. On account of the considerable size of the prostate, blade No. 3 was used, and as the left lobe was much larger than the right a much longer incision was made on that side. The posterior median cut was 3½ cm., and the right lateral 2½ cm. Time taken, 1 cm. to one minute.

Immediately after the operation the patient voided urine naturally and has never been catheterized since. In a letter dated November 5 the patient reports that he had not used a catheter since the operation, that he urinates once during the night, and four times during the day. He has less than 50 c.c. residual urine, that micturition is free, and the vesical inflammation greatly improved.

Case V.—J. P. A., aged seventy-one years, referred to me by Dr. Finney on September 28, 1901. The patient gave a long urinary history, which began with difficulty in micturition. Eleven years ago a stone was found by a surgeon and removed through a suprapubic opening. For two years following this he had a suprapubic fistula, which was finally cured by his taking up catheter life in 1895. Castration was then done by a second surgeon, and several weeks later another suprapubic to remove another stone. Stones soon recurred, and during the next twelve months four separate litholapaxies were done. In 1897 still another surgeon did a suprapubic operation, removed stones, and at the same time removed, by means of the Rongeur forceps, a moderate-sized median lobe, which was still present (despite the castration). After this operation, for the first time the patient was able to go without the use of the catheter, but micturition has been too frequent.

Patient on admission complained of irritation of the bladder. He urinated every two hours during the day, and twice during the night, but had no pain or discomfort during urination.

Rectal Examination. The outlines of the prostate were easily made out, and were a little larger than normal. In the median line the prostate presented a slight but distinctly abnormal rounded mass. The lateral lobes apparently were much atrophied, and sloped away from this central mass, which replaced the median groove and notch. The whole diameter of the prostate was half as large again as normal, the consistence of the lateral lobes soft and flabby.

Cystoscopic Examination. Rubber catheter met an obstruction about seven inches from the meatus. Patient had just

voided, but 320 c.c. of residual urine were found in the bladder. Cystoscope showed two fairly large stones in a pouch behind a considerably hypertrophied intra-ureteral bar. The mucous membrane of the bladder was much inflamed, but not markedly trabeculated. Examination of the prostatic orifice showed a small but definite transverse median bar, behind which there was a small *bas-fond*. There was no intravesical enlargement of the lateral lobes.

Remarks. The castration had removed the enlargements of the lateral lobes, but the median lobe persisted after that. The removal of this through a suprapubic opening allowed the patient to urinate without the use of a catheter, but there still remained a definite transverse bar at the median portion (the base of the middle lobe), which continued to act as an obstruction, 320 c.c. of urine remaining in the bladder after micturition. It was evident that after litholapaxy a Bottini operation should be done to remove the obstructing bar, but the amount of tissue beneath the instrument in the urethra was so slight that it was decided to use the smallest blade of the incisor.

On October 17, 1901, under cocaine and morphine, litholapaxy was done, and followed by a Bottini operation. All fragments were sufficiently crushed at the first introduction of the lithotrite, to be removed by evacuation afterward. In performing the Bottini operation blade No. 1 was used. Three cuts were made through the median bar, each $1\frac{1}{2}$ cm. long, one cut being in the median line posteriorly, the other two cuts were made at an angle of about 50 degrees to the median cut.

The patient stood the operation well, anæsthesia quite good, very little hemorrhage. When seen a week after operation he was voiding quite freely, and the residual had dropped from 320 c.c. to 150 c.c., and he was already feeling greatly improved. He attended his office on the fourth day after the operation.

December 21, 1901. Condition greatly improved. Bladder much smaller, residual often only 65 c.c. Urination easy, bladder tonicity improved.

Case VI.—J. A. B., aged seventy years, came October 18, 1901, complaining of enlarged prostate and catheterism. His urinary trouble began ten years before with difficulty and frequency, which soon became so aggravated that he began the use of a catheter, which he has used continuously up to the present time. For the past seven years he had been unable to void any urine naturally, and when admitted passed the catheter about every two hours during the day and about every three hours during the night. Examination showed a very greatly enlarged and much indurated prostate. The cystoscope revealed a moderate-sized stone in a pouch behind the prostate and a very much inflamed and trabeculated bladder. There was present a considerable intravesical outgrowth of the prostate which appeared as a collar-shaped enlargement, both lobes and the median portion being hypertrophied, the left projecting farthest into the bladder.

On October 31, 1901, litholapaxy was done under chloroform, and three days later a Bottini operation under cocaine and morphine. Blade No. 3 was chosen as the proper size for all of the cuts, of which three were made: one posterior, through the median bar, $3\frac{3}{4}$ cm. long; a right lateral, $2\frac{1}{2}$ cm. long; and a left lateral, 3 cm. long. There was very little hemorrhage following the operation. Immediately afterward the patient voided urine, and thereafter made a rapid convalescence.

On November 7, twenty-six days after the operation, he reported that he was rapidly improving, and that he passed urine once in three hours without any straining. A catheter introduced four weeks after the operation found no residual urine.

Case VII.—J. M. D., aged seventy-three years, October, 1901. Complaint, hypertrophy of the prostate and catheterism. Urinary trouble began about seven years ago with difficulty of urination, which very soon necessitated the use of a catheter. He has remained in fairly good health, but now has to pass a catheter about every four hours; twice

during the night. Increasing difficulty in introducing the instrument of late has driven him to the operation.

Examination. Prostate was much enlarged, about the size of a moderate-sized orange. Bladder capacity 430 c.c., tonicity rather poor. The cystoscope showed a very markedly trabeculated bladder with numerous small pouches. Both lateral lobes and the median portion of the prostate were very much enlarged, presenting a large collar-shaped intravesical hypertrophy around the urethral orifice, which projected well out into the bladder cavity, with a deep *bas-fond* behind.

October 28, 1901. Bottini operation; cocaine and morphine. Blade No. 3 was chosen. Four cuts were made, one in the median line posteriorly across the median bar, 3¼ cm. long, one right lateral cut, 3 cm. long. Through the left lobe two cuts were made, one lower oblique, at an angle of about 75 degrees to the median posterior cut, 3¼ cm. long, and one upper oblique, at an angle of about 130 degrees to the posterior median cut, also 3¼ cm. long.

On November 21, catheter revealed 10 c.c. residual urine.

January 10, 1902. Patient voids urine about every three hours, arises once during the night. Micturition free; general condition excellent.

CASE VIII.—S. M. A., aged fifty-six years, admitted October 28, 1901. Prostatic trouble began two and a half years before with difficulty of urination, which has gradually become more frequent and difficult.

The prostate, on rectal examination, was found to be only slightly enlarged and soft in consistence. A rubber catheter passed with some difficulty, owing to obstruction in prostatic urethra. Residual urine 185 c.c. (another examination three weeks later showed a residual of 375 c.c.). The bladder capacity was between 500 c.c. and 600 c.c., tonicity fair. Cystoscope showed a small median bar, which joined, without intervening sulci, two very slight intravesical enlargements of the lateral lobes. Behind this median bar was a definite but very deep *bas-fond* in which the ureters lay rather close up to the prostate. The intra-ureteral bar was considerably

enlarged, and behind it was a rather deep pouch. The posterior wall of the bladder was very greatly trabeculated, and between some of these trabeculæ, small, round, and oval openings were seen which connected with extravesical pouches. About one inch behind the left ureter a very considerable diverticulum, with a large round opening into the bladder, was seen, and the cystoscope was introduced into this for some distance. With a finger in the rectum and the cystoscope in the urethra, the amount of prostatic tissue between them was found to be very moderate, more than in Cases II. and V., but much less than usual in prostatic enlargements.

The rectal examination and cystoscopic examination both showed only a slight enlargement of the prostate, but the considerable residual urine and the marked evidences of obstruction, as shown by the trabeculation and pouch formation in the bladder wall, made it evident that there was considerable hinderance to urination. The prostate was so small that prostatectomy would have been difficult, although the patient was in splendid shape for any operation, and the ordinary Freudenberg instrument would undoubtedly have been dangerous to use on account of the danger of penetrating the capsule of the prostate. Blade No. 2 of our instrument appeared to be the proper size to be used with cuts no longer than 2 cm.

On November 20, 1901, a Bottini operation was done under cocaine and morphine. Blade No. 2 was used in accordance with the cystoscopic and rectal examination, as stated above, and five cuts were made (more than necessary, I think, now). One median posterior, and two oblique on each side, one at an angle of 75 degrees to the median posterior, and the other at an angle of 120 degrees, each cut being 2 cm. in length.

December 13, 1901. Convalescence good. Has not required a catheter. Voids urine freely, 300 c.c. at a time. Residual urine, 0 ; steadily improving.

Summary. Reviewing the eight cases reported above, we find four cases (III., IV., VI., and VII.) in which blade

No. 3 was used. All of these were fairly large hypertrophies of both lateral lobes and median portion, and were suitable cases for Freudenberg's instrument. In two cases (I. and VIII.) blade No. 2 was used. In both of these the prostate was very slightly larger than normal, as shown by rectal, instrumental, and cystoscopic examinations, but in both of these cases there was marked evidence of obstruction, and the cases urgently needed operation. In both cases, however, incisions made with Freudenberg's instrument would probably have penetrated beyond the confines of the prostate. But the operations were safely performed with blade No. 2 of our instrument.

In two cases (II. and V.) blade No. 1 was used. In both the obstruction was caused by a very small median bar, associated with complete atrophy of the lateral lobes (after castration) in one case, and lobes of normal size in the other. In these cases the amount of tissue beneath the instrument was so small that we feared to use even blade No. 2. In another case (not here reported) the enlargement consisted in two very large lateral lobes, associated with a complete absence of median bar, the urethra skirting the posterior surface of the prostate and the amount of tissue between the rectum and a sound in the prostatic urethra being very small. In this case we used blade No. 3 for the lateral lobes, and blade No. 1 for the posterior cut. I have not as yet used blade No. 4, and hardly think it will often be necessary, except to attack a single very great hypertrophy of one lateral lobe. I have, however, seen several tremendous general hypertrophies in which it would have been necessary. In this instrument I believe we have many distinct advantages over that of Freudenberg, especially in the ability to choose the depth of blade in accordance with the size and condition of prostate present, as shown in some of the cases given above.

As to the relative merits of the prostatectomy and the cautery operations, I do not think we are as yet in a position to decide exclusively for either.

As shown by the statistics of my cases, both operations

may be followed by death in desperate cases, and the operator's judgment is responsible, and not the operation.

It is when the patient is in good condition—not too old, with bladder tonus not greatly impaired, no definite kidney lesion present, and the prostate suitable for enucleation—that the question is still unsettled as to whether a Bottini is as effective as a prostatectomy. We know that the latter furnishes almost perfect results, and it remains to be proved whether the Bottini can equal it. The Bottini is unquestionably a simpler procedure, and has the advantage that it can be performed without general anæsthesia and that the patient is up in a few days. These characteristics make it without doubt the operation of choice for those who have been much weakened by the disease or by age.

If asked to be specific, I would say that the Bottini operation is to be preferred to a prostatectomy :

1. When a patient has passed sixty-five years of age, unless very robust.

2. When a younger patient, on account of degeneration of the bladder or kidneys, or general weakness, is no longer a fit subject for a major surgical operation.

3. When the obstructing prostate is so indurated or small as to render enucleation difficult or impossible (except cases where the obstruction consists entirely in a median lobe).

4. When definite contraindications to general anæsthetics are present.

5. When it is necessary that the immediate convalescence be short (for business reasons).

SUPRAPUBIC PROSTATECTOMY.

By Floyd W. McRae, M.D.,
Atlanta, Ga.

There is no more pitiable surgical condition, nor any suffering more nagging, continuous, or prolonged, than that endured by the victims of senile enlargement of the prostate. The hope of permanent relief which surgeons hold out to the victims of this dreadful disease is so small compared with the risk incurred by the measures suggested for its relief, that few old men are willing to accept the chances; and most of them go from bad to worse under the so-called palliative treatment, dying the most painful deaths.

The treatment of enlarged prostate by other than surgical radical removal or complete prostatectomy has, in my hands, and in those of the majority of surgeons with whose work I am familiar, proved so unsatisfactory that I feel sure many of the measures resorted to for the relief of this condition are mere makeshifts. The mortality of the so-called simple operations is altogether out of proportion to the magnitude of the operations and the resultant benefit.

The suprapubic fistula gives permanent relief in rather less than one-third of the cases. Vasectomy has a large mortality, with a small percentage of permanent relief, and is frequently followed by marked psychical disturbance. Orchidectomy has a mortality of more than 20 per cent. It is very often followed by insanity or marked psychical phenomena. I believe the cases in which vasectomy or orchidectomy are indicated are very few indeed. The probable benefit is too small to justify the risk incurred by these operations. The supra-

pubic fistula is a continued source of disgust to the patient. The bladder frequently does not empty itself completely through this fistulous opening, and unless great care is exercised the residual urine becomes exceedingly foul, setting up a very aggravated form of cystitis. The prostate goes on enlarging seemingly with greater rapidity than before the fistula was made. I have had occasion to operate the second time on three patients who had carried these fistulæ for several years. In every one of these cases the bladder was divided into a large and a small pocket by the prostate, which had enlarged until it pressed upon the anterior wall of the bladder where it was in contact with the abdominal wall. A small quantity of urine would find its way from time to time into the urethra through the smaller of these pockets, giving rise to the most intense pain, and setting up a great deal of urethral irritation. The larger pocket, or that portion of the bladder above the prostate, had lost to a great extent its contractility, seemingly from the presence of the large foreign body interfering with normal muscular action.

With the Bottini operation I have had no personal experience, but have followed the work of others with much interest. Theoretically and from a pathological stand-point, I am not favorably impressed with the operation, notwithstanding the reported good results obtained. The reported successes following this operation, even in the hands of the most skilful operators, have been made too early to convince me that the resultant relief was permanent. The tendency of modern surgery is toward the adopting of more radical measures early in the course of this disease, before the bladder has become profoundly affected or the function of the kidneys has been seriously interfered with. The operation of complete prostatectomy, which has heretofore been done only as a last resort, promises to be adopted early by general surgeons who are capable of doing this class of work. Quite an impetus has been given to this procedure by the acrimonious discussion of the clinical lecture of Mr. P. J. Freyer, published in the *British Medical Journal* of July 27th. Mr. Freyer claims to remove the prostate,

including the glandular and fibrous tissue, entire, without interfering with the urethra, by an original method. Mayo Robson, Nichols, and a number of other English surgeons claim that his is only a modification of the McGill operation for enucleation of the prostate, and very like that suggested and practised by Dr. Eugene Fuller, of New York. The pathological reports of the specimens removed by Mr. Freyer showed them to be almost pure adenomata. As a result of this discussion, a number of unpublished cases have been given to the profession. The results of these cases, in the hands of many surgeons, in very aggravated cases, have been most gratifying.

In America, Fuller, Alexander Keyes, and Guitéras have contributed liberally to the literature on prostatectomy. Horwitz, Lewis, Guitéras, Meyer, and others have reported long series of Bottini operations. That so many operations are being done and new methods suggested for the relief of this condition, is sufficient evidence that surgeons are not agreed as to the best method of treatment. No single operation is applicable to all cases, and bad results follow improper selection. It is the duty of every surgeon who has done any work along this line to give his results to the profession. Personally I am convinced that the general adoption of complete removal of the prostate early in the course of the disease will be the practice of the future. I believe instead of resorting to palliative treatment, vasectomy, orchidectomy, suprapubic fistula, or the Bottini operations, surgeons will resort earlier and more frequently to complete prostatectomy by either suprapubic or perineal methods. The cases which I present, together with the pathological reports of the specimens removed, are brought forward solely with the idea of giving my results and inviting discussion on this most important subject. The only originality in the operations is in the manner of removing the prostate, and the method of draining. I incise the mucous membrane and outer capsule of the prostate over the most prominent point of each lobe, and remove each lobe separately. I then put in a retention catheter and a supra-

pubic drainage-tube made from an ordinary rectal tube, so that it is also self-retaining. The bladder is then closed snugly around this tube, the structures of the abdominal wall closed accurately with a small strip of gauze down to the bladder surface, to take care of the slight leakage of urine that takes place immediately following the operation. This gauze is removed in from twenty-four to forty-eight hours, when the tissues contract snugly around the tube, preventing any further leakage. In two of the three cases reported there was absolutely no leakage of urine around either tube after the first few hours. The drainage in all of these cases was most satisfactory and convenient. The bladder was washed out with great facility and readily kept clean. The catheter left in the urethra produced exceedingly little irritation and seems to me a most valuable adjunct to the operation.

The freedom from pain following the operation was a revelation to me. In two of the three cases no anodynes or hypnotics of any kind were required. The shock was very small and the reactionary temperature almost *nil*. Hemorrhage was not excessive or difficult to control. The urine was allowed to drain into an ordinary bed urinal, and the patient permitted to lie on the back or either side at will. The time elapsing since Cases II. and III. were operated upon is too short to tell what the permanent results will be, but the present condition is most promising. I hope to keep these patients under observation and report permanent results later.

Case I.—Mr. A. A., aged fifty-six years, European Jew, merchant. Never sick until about ten years ago, when urine began producing a stinging sensation in urethra. This gradually grew worse, also stream diminishing in size and freedom of passage. Later began having pain, with desire to urinate; passing pus in urine; contracting sensation at neck of bladder. Continued so until February, 1899, when he had total obstruction and catheter could not be passed. Was aspirated twice and a suprapubic cystotomy then done, followed by permanent drainage through silver tube. Very little urine passed by urethra

after operation. Drainage was a constant source of annoyance; having to empty bladder frequently, each evacuation being accompanied by the contracting pain in prostate. In March, 1901, went to bed with "rheumatism" in both legs. Began passing much pus through tube; tube often becoming occluded and had almost constant griping pain in prostate. Latter part of May had severe hemorrhage from bladder. Slight bleeding with much pus continued until operation.

Admitted to St. Joseph's Infirmary May 14, 1901, (Operation, May 15, 1901.) Temperature 98.5°, pulse 96. Bladder beefy, red, mucous membrane pocketed and feeling like coils of intestine. Suprapubic drainage opening enlarged; bladder incised over right lobe of prostate with bistoury and lobe slipped out easily; middle and left removed piecemeal. Hemorrhage not severe and readily controlled by hot-water irrigation. Scar tissue of drainage wound removed, and incision closed with silkworm-gut to upper angle, where No. 30 F. (McR.) retention catheter was placed. Retention catheter (No. 22 F.) also placed in urethra, it being passed antero-posteriorly by probe and silk thread. Suprapubic tube was long enough to pass along penis and enter urinal with urethral catheter. Rectal bag. 3 P.M. temperature 98°, pulse 75. Temperature remained between 99.4° and 99.8°; pulse 80 to 95.

No pain, slept well. Drainage complete into urinal, mostly through urethral catheter. Bladder irrigated daily with 1-6000 permanganate solution. On May 19th, dressing dry; urethral catheter removed, having caused no irritation, and a No. 16 F. straight one placed in. This was kept in off and on till the 29th, then it remained in only six hours. Urine passing by upper catheter until this date when some passed by urethra and suprapubic tube removed. May 31st suprapubic opening plugged and most of urine passed by urethra. On June 3d No. 25 F. catheter left in urethra six hours. Thereafter urine passed by urethra and wound closed rapidly. Patient for some two or three weeks irrigated bladder once daily, but there has been no pus or irritation since closure. Patient says to-day

(November 6th) he has had no pain or trouble whatever since operation; has gained 40 pounds; passes urine every two or four hours, according to amount of water taken, and can control flow about half an hour after desire to urinate. Urine normal in color and free from pus or mucus. Bladder holds eight ounces (measured), and he can project stream four and a half feet (measured). Does not have to get up more than once to void urine during the night, often does not have to get up at all.

Case II.—Mr. J. C. D., aged fifty-seven years; American farmer. Six years ago urine, in the morning, began passing in teaspoonfuls until bladder emptied; had no trouble during remainder of day. Continued thus for a year, when he had sudden stoppage. A catheter was passed and urine voided. Catheter would have to be introduced every second or third morning for about three years. For past two or three years has had pus; pain at neck of bladder, and catheter has been passed regularly and frequently to withdraw urine. First of this year, in Baltimore, castration was advised. In June, Bottini operation was done in St. Louis. Since this was done he has suffered constant pain; had frequent desire to urinate, having to use catheter every two or three hours, much blood and pus passing each time. Sometimes when bowels moved passed small amount of urine, with, however, considerable pain. Examination at office October 2d. Prostate very much enlarged; urine heavily loaded with blood and pus and uric acid masses.

Admitted to St. Joseph's Infirmary October 7, 1901. Temperature 98.8°, pulse 76. Operation October 10th. Gas-ether. Vessels from skin to bladder numerous and bled freely. Bladder considerably thickened, and as soon as opened hemorrhage from its inner surface was profuse and continued so until prostate was removed. Transverse cut made in bladder with scissors, after catheter had been fixed in urethra. Gland removed with much less difficulty than was expected. Hemorrhage not completely controlled by hot irrigation. Wound closed with silk-

worm-gut about drainage-tube, which was placed as in Case I. Iodoform gauze carried by tube to bladder. Some oozing continued for twenty-four hours, once blocking both tubes. This was relieved by irrigation, and drainage remained good. No rectal bag used. Considerable bloody leakage about upper tube. Irrigated daily with saline solution, and hemorrhage gradually diminished, but always a little, while irrigating through urethral catheter. Drainage remained good, greater portion of urine passing through upper tube. Mucus gradually increased, forming a thick layer in urinal. When gauze about tube removed, the sixth day, considerable amount of mucus escaped from wound. Two days later there was considerable amount of leakage about upper drainage on account of both being stopped by mucus. Stitches were removed, slight separation resulting at point of drainage. On ninth day tubes closed by mucus. Urethral catheter removed; no irritation; a No. 27 F. straight catheter introduced which caused slight bleeding from bladder. Some urates had accumulated with increase of mucus until eleventh day, when amount of both was very large.

Suprapubic catheter was taken out and bladder irrigated with bicarbonate of soda. Urethral catheter in only part of the time. The mucus gradually disappeared upon nitrate of silver irrigations, but urates continued to deposit about wound forming several masses just within suprapubic wound, which were removed by forceps. Urethral catheter could be kept in but for a short time on account of nervousness of patient and contraction near meatus which resulted from Bottini burn, and continually caused him pain. Some urine passed by urethra on twenty-second day, and then a little each day until twenty-eighth day, when on withdrawing No. 25 F. catheter, introduced after meatus had been dilated, there was a small flow of solution. On this date a large mass of urates removed from the internal portion of the suprapubic wound, which had closed about the McGuire plug, introduced first on the twenty-fourth day. On this, November 7th, the twenty-eighth day some urine passing by urethral catheter in urethra part of the time; McGuire plug in suprapubic wound, but does not completely control flow of

urine, as wound not yet tight about it; urine free from pus and mucus; considerable formation of urates, but less than before. Difficult matter to get patient to drink sufficient water to hold them in solution.

"November 8, 1901.

"Dr. F. W. McRae,

"Atlanta, Ga.

"My Dear Doctor: I beg to submit the following report of the examination of the prostatic tissues of J. C. D., which you sent me on October 12th.

"The specimens consisted of three pieces of unequal size; two of these being irregularly rounded, the larger having a diameter of 1.5 cm. in one direction and 1 cm. in the other, while the second is 1.4 cm. by 8 cm. in diameter. The larger of these is double convex, and is 6 mm. in thickness in centre; the smaller is concavo-convex, and is 5 mm. thick. The third specimen appears to be merely a thin sheet of fibrous tissue, such as the capsule of the gland might be, to which a few small masses of tissue are attached. The specimens weigh 0.5, 0.25, and 0.15 of a gramme respectively. The tissues composing all three of these specimens are of a grayish color and are exceedingly tough. In this report the three pieces of tissue will be respectively designated as *a*, *b*, and *c*.

"*Microscopical Examination* (*a*). The structures composing this piece of tissue consist of unstriped muscle fibres and connective tissues and gland-like bodies in about equal amount. The muscular tissue considerably exceeds the connective tissues in quantity, and consists of unstriped fibres of a diameter at their widest portion of from 5 to 7μ, and of a considerably greater though variable length—some of them being as much as 75μ in this dimension. These structures show absolutely nothing abnormal. The white fibrous tissue exceeds in quantity the elastic tissue to a considerable extent, though the latter, as exceedingly delicate fibrils, is quite a conspicuous structure in properly stained specimens. The white fibrous tissue is found almost entirely in the vicinity of the gland-like bodies above referred to, and intermingled with it there is always a certain

amount of elastic tissue. Lying between the muscle fibres there are here and there minute collections of lymphoid cells, and an occasional plasma cell (real fibroblast). Between the fibrils of connective tissue that lie around the gland-like bodies similar collections of cells are generally present, and in some instances have almost replaced the pre-existing tissues of the part. The plasma cells (fibroblasts) are here in many instances quite abundant, and there can be no question that a new formation of fibrous tissue is going on, and the process could therefore be looked upon as what is commonly called inflammatory. In addition to the above-mentioned cells there are a few fixed connective-tissue cells lying here and there between the masses of fibrous tissue. The elastic tissue is also distinctly seen to form the basement membrane of the glandular bodies, as is always the case in other structures of a similar kind. The tissues are numerously supplied with bloodvessels, none of which shows any alteration.

"The gland-like bodies vary greatly in size, some of them being as much as 1 mm. in diameter, while others measure no more than 50μ; in sections they appear oval or rounded, and only occasionally present irregularities of outline indicative of pressure from newly-formed connective tissue. These glands are lined for the most part by columnar epithelial cells, though in many instances they are cubical, and in some cases even somewhat flattened. Piled up upon the cells that form the basal layer there are generally quite a number of irregularly shaped cells which give the appearance of a stratified epithelium. The basal layers of epithelial cells vary considerably in size, and as a general rule they are from 5 to 15μ in height and about 5μ in width. They contain a single vesicular nucleus which is placed near their bases, in which are one or more nucleoli. Those cells that lie above the basal layer vary so much in form that it is impossible to give their dimensions, though their cubic contents would probably average about that of the cells just referred to, the former being evidently desquamated examples of the latter that have not been expelled from the tubules and that have not as yet undergone complete

degenerative change. These shed-off cells contain nuclei and protoplasm that in every way resemble that of the cells lying next to the basement membrane. In the central portions of these gland-like bodies there is generally present a fine, granular débris which is for the most part acidophilic, though there are many very minute basophilic particles; these masses evidently represent degenerate and completely broken up epithelial cells. There are also not uncommonly present in the lumina of the glands corpora amylacea, all of which are decidedly basophilic. Some of these gland-like bodies so closely resemble those that occur in the prostate gland that there can be but little doubt that they are practically normal structures, though even in these so-called catarrhal changes were evidently present, as is evidenced by the unusual proliferation and desquamation of the epithelial cells lining them. In other cases these structures are probably of new formation and constitute a true adenoma of the parts. A certain amount of secretion must have occurred in most of them, for in addition to the corpora amylacea and granular débris above referred to many of them contain considerable quantities of some liquid substance, the collection of which has produced a very considerable degree of dilatation of their lumina. No bacteria were found in any part of the tissues, though it is not unlikely that they were present somewhat earlier.

"(*b*) and (*c*) The structure composing these masses of tissue resembles in every way those that have just been described, and a separate description is therefore unnecessary. It may, however, be remarked that in *c* a cystic dilatation of one of the gland-like bodies is found that measures 2 mm. in diameter.

"There can be no doubt that the tissues examined constitute part of a true tumor formation, since there is apparently an increase in the muscle fibres and the formation of a number of new gland-like bodies. The connective tissues are likewise increased, but the presence of considerable numbers of lymphoid and plasma cells (fibroblasts) in the areas where this is principally occurring would make it appear that this process is really one which is related to the so-called chronic inflammations.

In addition to these, while it is true that the epithelial cells in adenomata are very frequently found lying loosely in the lumina of the glandular structures, it is equally the case that changes of a similar kind occur in what is called catarrhal inflammation, and it seems to me not unlikely that the entire process may have originated as a result of the entrance of bacteria into the glandular structures of the prostate, with the production of catarrhal change, and later of so-called inflammatory change in the surrounding tissues. While it is by no means certain that irritations brought about by bacteria are capable of setting up true tumor formations—which we have in this case—facts are not wanting that point toward this occurring in some instances, and it should be at least considered as a possibility in this case.

"*Diagnosis.* Leiomyoma adenoma, with increase of connective tissues as a result of chronic irritation.

"Respectfully submitted,

"H. F. HARRIS."

CASE III.—Mr. W. R., aged fifty-nine years; American farmer. About eighteen years ago urine began to flow slowly. This became more marked, and stream slowly became smaller. 1890-1895 was in buggy greater portion of his time, and condition became much worse; urine voided often, and with each desire to urinate had heavy pain at neck of bladder which passed off only when bladder was emptied. This continued with pus, and having to urinate every hour or two until February, 1899, when he had bleeding from bladder. He began using permanganate irrigations, and blood and pus soon subsided. Catheter was used, and aching in prostate and down the thighs continued, though urine was retained four to six hours. In June, 1901, while withdrawing catheter, noticed pus at meatus. In few days he was in bed to remain two weeks, with considerable fever and pain until abscess of prostate ruptured into rectum, when he was relieved. Use of catheter continued, size reduced, however, from No. 23 to a No. 16 F. Pain in

prostate and in legs continued, and some pus now and then by rectum until two weeks ago, when last passed.

Admitted to St. Joseph's Infirmary September 13, 1901. Temperature 97.5°, pulse 76. Passes catheter every four or six hours; has heavy aching in prostate when bladder is full; pus follows catheter out, though urine is almost clear. Prostate very large, and band one inch wide passes from prostate along right rectal wall, causing lumen of rectum to be reduced in its lateral diameter. In good physical condition.

Operation, October 17, 1901. Gas-ether. After bladder filled with saline solution and catheter fixed in urethra, suprapubic opening was made in bladder without hemorrhage from its surface, wall being in good condition. Transverse cut was made across base of bladder, and the middle lobe removed by piecemeal and with considerable difficulty. Also fibrinous tissue, size of index finger, the remains of fistula, which passed backward to rectum, removed. Other two lobes enucleated with but little trouble. Wound closed with silkworm-gut and catheter and tube placed as in Case I., except one above was in middle of wound, and incision was closed firmly about it except for two small pieces of drainage gauze to the deeper tissues. No rectal bag used. Two fingers of assistant were placed in rectum. October 18th to 19th no bleeding; drainage perfect; dressing dry. Irrigated with permanganate. Drainage perfect, mostly through urethral catheter; irrigated daily with 1 : 6000 permanganate potash; no irritation about stitches or catheters. Urine remained clear until fifth day, when some mucus was noticed in irrigating fluid. This increased until both catheters were removed on the eighth day, when it rapidly subsided. Catheter has been kept in urethra part of each day since the eighth day. On eighteenth day, when not in, urine passed by suprapubic opening. On eighteenth day McGuire plug put in opening; this has allowed leakage when catheter not in, or bladder emptied by a catheter until to-day, November 7th, twenty-first day, when, upon removing large catheter from urethra (used for irrigating) fluid passed freely from urethra, and has continued so to do.

"NOVEMBER 8, 1901.

"DR. F. W. MCRAE,

"Atlanta, Ga.

"MY DEAR DOCTOR: I beg to submit the following report on the results of the examination of the tissues of W. R. which you recently sent me:

"Two of the specimens received were said to consist of prostatic tissue, while the third was thought to have been scar tissue from the site of an old healed-up sinus. The specimens from the prostate were about equal size, each weighing about 0.25 gm.; they are lenticular in form, both measuring about 8 mm. in diameter and about 4 mm. at their thickest portion. They consist of grayish, quite solid and tough tissue, and upon one side of each their tissues are condensed into what appears to be a capsule. The specimen from the healed-up sinus is irregular in form, weighs 0.5 gm., and in its physical peculiarities resembles the tissues just referred to.

"*Microscopical Examination.* On microscopical examination it is found that the sections from the pieces of tissue from the prostate consist entirely of unstriped muscle fibres and connective tissues, there being no glandular structures in any of the specimens examined. By far the greater part of the tissues composing these specimens consists of unstriped muscle; the fibres are from 5 to 7μ in width at their thickest portion, and taper toward their extremities, and are from 40 to 75μ in length. Intermingled with the structures just referred to there is a fine, delicate stroma of elastic tissue, and here and there are a few masses of white fibrous tissue. In addition to the structures above described there are scattered through the tissues a few lymphoid cells, and in addition to these a connective-tissue cell is sometimes encountered. The tissues are quite vascular, there being quite a number of small arteries and a great many minute veins; the latter show no alteration, but the outer portion of the walls of the former are in many instances decidedly thickened as a result of the formation of white fibrous tissue and a small amount of elastic tissue.

"The piece of tissue said to have been removed from the site of a healed-up sinus shows all the changes that have just been recorded as being present in the other specimens, with the addition that there are found within it a few gland-like bodies. In sections these are rounded or oval in form, and vary in diameter from 50 to 100μ. Attached to the elastic-tissue basement membrane there is always a layer of epithelium which consists of columnar or cubical cells from 5 to 15μ in height, and about 5μ in thickness; all of these cells contain near their bases vesicular nuclei in which there are one or more nucleoli. Lying upon this stratum of epithelial cells there is usually present one or more irregularly shaped cells of the same kind that have evidently desquamated from the basal layer; these are exceedingly irregular in form, but resemble in other ways the cells that have just been described. In the lumina of these gland-like bodies there are not uncommonly detached epithelial cells, intermingled with a considerable amount of débris, and corpora amylacea are sometimes found. The detritus in the glands is almost entirely acidophilic, though here and there there are present a few basophilic granules. In addition to the solid structures these glands evidently contained a considerable quantity of watery fluid. Around these glandular structures small collections of lymphoid cells are sometimes found, intermingled with which there is an occasional plasma cell (fibroblast).

"The histological examination of these specimens would indicate that the new formation of unstriped muscle fibres and, to a much less degree, connective tissues has occurred without any appreciable increase of the glandular-like structures of the part. It may, however, be the case that the primary alteration consisted in an increase of the parenchyma of the organ, and that it has later been replaced by the interstitial structures, as is thought to be sometimes the case. In the two pieces first described the glandular structures have evidently been replaced by muscular tissues. None of the tissues exhibit any marked evidence of so-called inflammatory change, though the presence here and there of a few lymphoid cells would indicate

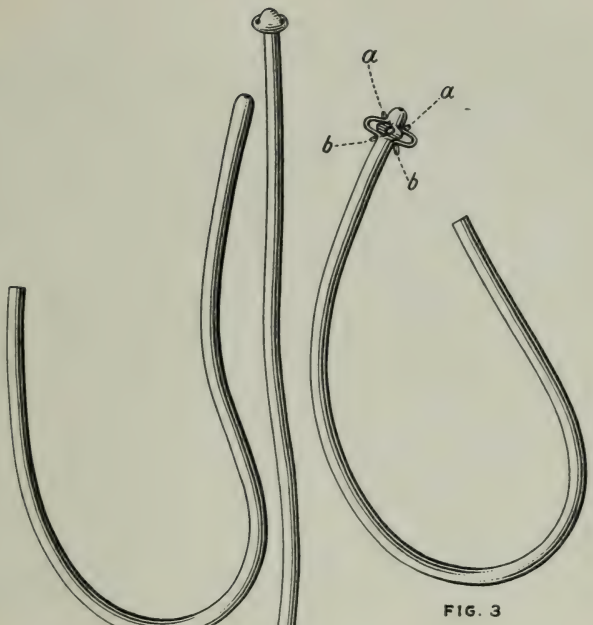


FIG. 1

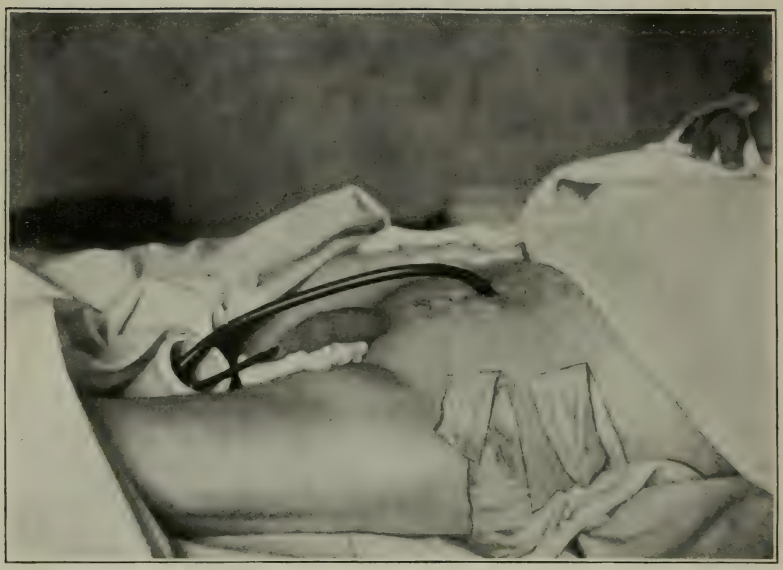
FIG. 2

FIG. 3

Fig. 1 is a rather stiff rectal tube 20 inches long and size of a No. 32 F. catheter. At its conical end this tube is cut into quarters; incisions beginning ¼ inch from end and continuing for one inch, and should be made with a sharp knife, one side cut at a time while tube is pressed flat between thumb and finger. Thread a needle with a medium-sized rubber band (¼ inch wide) and pass through near the end of a band (Fig. 3 *a*) and bring out at the other end (Fig. 3 *b*). Do likewise with the opposite "quarter." Now draw one end of each band until the segments assume form of Fig. 3.

Fig. 2 is a Pozzer self-retaining catheter No. 20 F.

Fig. 3 is the tube photographed in Case IV.



The above photograph is of the fourth case, Mr. J. D. R., and represents the tubes as used in each of the other three.

A silk suture is passed, by a needle, through the surface of the catheter in urethra, at time of operating, then through eyes of catheter, Fig. 2. When the former catheter is drawn into the bladder, permanent catheter is carried with it. Bladder is irrigated through this, when suprapubic wound is closed tightly about tube (Fig. 3) at its middle. A gauze dressing, with cotton, is placed on wound about this tube and is held by two adhesive strips; an abdominal binder is placed over all, the tube coming between its ends Suprapubic tube rests along penis, which is wrapped with two or three folds of gauze, which is also carried over the suprapubic tube and is then pinned to lower border of binder to prevent slipping. Both tubes are then placed in a urinal containing an antiseptic solution. Patient may rest on back or either side, urinal being changed to accommodate. The irrigating fluid may be introduced by either tube, returning by other without leakage at wound. Simple traction on catheter for removal.

a mild degree of irritation in the parts, and the thickening of the walls of the arteries is of like significance. Everything points, however, to the conclusion that the alteration in this instance is not inflammatory, but the result of a genuine tumor formation.

"*Diagnosis.* Leiomyoma of the prostate.

"Respectfully submitted,

"H. F. HARRIS."

Record of Cases II. and III., since reading of above paper.

The second case, Mr. J. C. D., was hard to control. On November 8th, twenty-ninth day, a large mass of urates was removed from the suprapubic opening. This frightened him, and from then on he drank one-half to one gallon of water per day, having no more trouble from urates, and was out of bed from this date. He passed more and more by urethra, and there was but little leakage from wound. November 18th, felt stone (?) impacted in prostatic cut. November 20th, the bladder was cocainized and investigated, no stone being found. With enlarged suprapubic opening, he continued to pass urine by urethra. Irrigated, and sounds passed (20 to 29 F.) every third day, from November 20th to December 2d. December 2d, passing urine entirely by urethra; good stream with ease, and only slight leakage at night. Went home in much better mental and general condition, being entirely relieved of his prostatic trouble.

Patient writes, December 11th, "wound has completely healed, and am passing urine all right; no other trouble."

The third case, Mr. W. R., improved rapidly. The wound closed rapidly around small McGuire plug, and the amount of urine by urethra increased daily. He left the infirmary on the twenty-ninth day, with very small fistulous opening. Remained in the city until November 22d (the thirty-sixth day), during which time he was irrigated every second day, fistula becoming very small, valve-like, and leaking only upon lateral motion of

the body; stream became large, and he was able to project some four feet.

He writes, December 6th, "am feeling well in every respect; my wound is entirely closed, and I can 'drapp' my urine five feet from my toes with ease," etc.; also, on February 14th, "rode forty miles in a buggy without discomfort; sleep all night, and feel better than I have in fifteen years."

MEDIAN PERINEAL PROSTATECTOMY: TOTAL REMOVAL OF THE PROSTATE GLAND IN SIX CASES.

By Alexander Hugh Ferguson, M.D.,
Chicago, Ill.

There are so many different methods of treating prostatics that one is forced to the conclusion that the subject is in an evolutionary stage. I venture the assertion that every surgeon of experience has often been disappointed with many of the procedures he had employed. It is true that every case is more or less a special one, having individual features and combined phenomena of its own; but when we consider the radical treatment—that is, total prostatectomy—it should not take us very long to establish one method as the safest and best. The era of giving permanent relief to over 25 per cent. of the male population in the last third of life began in 1887, with, first, Belfield, of Chicago, and then McGill, of Leeds, England. They did a partial, and then, as they improved their technique, complete suprapubic extirpation of the prostate gland. At the present time, through the combined efforts and experience of surgeons the world over, not forgetting to give a larger amount of credit to American surgeons, suprapubic total prostatectomy, with a perineal incision for drainage, is about as perfect as can be expected. I am surprised to notice that Mr. P. J. Freyer, of London, England, in speaking of suprapubic prostatectomy, gives no credit to other surgeons for removing the entire gland by that method. In closing a lecture delivered by him at the Medical Graduates' College, June 26, 1901, entitled "A Clinical Lecture on Total Extirpation of the Prostate for Radical Cure of Enlargement of that

Organ," he makes the following statement: "I think I shall not be accused of exaggeration when I state that all previous so-called methods of radical cure of enlarged prostate are unsatisfactory, and that catheterism, though the least objectionable mode of treatment in the vast majority of cases, is liable, sooner or later, to terminate in cystitis or other dangerous complications. I submit that the thoroughly successful results obtained in these four cases of total extirpation of the enlarged prostate encourage us in the hope that we have at last arrived at a rational method of dealing with this painful and frequently fatal malady."[1]

This is an illustration of a surgeon probably too busy to look up the literature on his own special subject. In accordance with our American text-books on genito-urinary surgery, let alone the most recent articles in medical journals, the claims of Mr. Freyer that, by his procedure, "we have at last arrived at a rational method," etc., come too late.

We have all been practising it, and still we are not satisfied. The patient is often disappointed with the results. The dangers from shock, hemorrhage, and sepsis by this method are not trifling; the mortality is too high; the discomfort from the suprapubic incision, with sometimes a permanent fistula as a sequel, is objectionable; in a proportion of cases the bladder fails to regain its power of expulsion, especially when all the urine had to be drawn off by catheter before the operation was performed. The prostate is difficult of extirpation from above, and when large masses are removed, they overstretch the neck of the bladder, and incontinence of urine may result. It must not be forgotten that the prostate is situated external to the bladder, and it seems too bad that the latter should be attacked and injured in front and behind in order to deal with offending portions of the former. I shall endeavor to show that the entire prostate can be removed more quickly and safely through the perineum than through the bladder. Let me first briefly state what has been done by other surgeons in this line.

[1] British Medical Journal, July 20, 1901.

In 1895, six years ago, Nicoll, of Glasgow, removed the prostate through a T-shaped incision in the perineum. He did an intracapsular enucleation with the fingers of one hand, while through a suprapubic cystotomy he made counter-pressure from above within the bladder with the fingers of the other hand. He packed the perineal wound with gauze, inserted a retention catheter through the urethra into the bladder, and closed the suprapubic wound.

In 1896 Alexander improved Nicoll's operation by performing suprapubic and also a perineal cystotomy. He cut through the membranous portion of the urethra. After enucleation he drained both ways.

Guitéras performed a perineo-prevesical operation. He opened the space of Retzius suprapubically, through which he made counter-pressure on the bladder without opening it here.[1] Another method of Guitéras is the vesicorectal method. It is objectionable to open the rectum, and the same can be said of the prevesical space or bladder.

Syms[2] endeavors to aid perineal prostatectomy by using a rubber retractor, with which he claims "to pull the bladder and prostate down into the perineum, so that the lobes can be reached and enucleated with the index finger. This retractor consists of a soft rubber bulb cemented to the end of a strong rubber tube of a calibre of a 38 French scale. It is introduced into the bladder through an opening in the membranous portion of the urethra; the bulb is then distended till it has a diameter of two and one-third or three inches." In this operation the membranous urethra is opened, which can be avoided by the method which I practice. The injury to this portion of the urethra is objectionable, and the overstretching of the neck of the bladder by means of the bulb of the retractor is, I am convinced, a serious procedure. Let me here quote his own words: "In two of the cases there was incontinence of urine for some weeks." In one case the patient regained control of his bladder, but in the other the incontinence is permanent, as

[1] Philadelphia Medical Journal, April 20, 1901.
[2] Journal of the American Medical Association, November 2, 1901.

is honestly given in a foot-note. Dr. Syms had no mortality. This result to the neck of the bladder is exactly what might be anticipated from such a retractor. Powerful traction made on the retractor dilates the neck of the bladder unduly, and incontinence is the result. In connection with the literature of perineal lithotomy many cases of permanent incontinence of urine are recorded following the forcible extraction of a large stone.

Von Dittel, previous to Nicoll's operation, had several times successfully removed the prostate through an extravesical incision, beginning at the apex of the coccyx and going to the right of the anus in a semicircular manner. The dissection is carried along the side of the rectum to the prostate, etc. Several other surgeons have operated by this method. A crescentic incision in front of the anus has been done by several surgeons, even for a partial prostatectomy, but in reaching the prostate undue destruction of the perineum was done. The most recent surgical text-books, Bryant's *Operative Surgery*, for instance, state that "if the prostatic urethra be so much lengthened because of the prostatic hypertrophy that the finger is not available for exploration purposes, this method (median perineal prostatectomy) of operation should not be practised." In the literature are found the writings of many surgeons in connection with partial as well as complete prostatectomy through the perineum. Chief among these are T. E. Bryant, Gouley, Eugene Fuller, Reginald Harrison, Mercier, G. Frank Lydston, R. D. Webb, and H. H. Young.

By the method I am about to describe all forms of prostatic enlargement are successfully treated.

Operation. Put the patient asleep with chloroform, and place him in the extra-lithotomy position; insert the prostatic depressor (Fig. 1, *a*) into the bladder through the urethra and hand it over to a trusty assistant. Push a sponge into the rectum to prevent escape of liquid feces. Then introduce the middle finger of the left gloved hand into the rectum, and press it against the urethra at the junction of membranous and prostatic portions; pass a long, narrow-bladed knife into the

perineum through the raphe, in the median line, two inches in front of the anus, until it reaches near the tip of the finger in the rectum, and with one stroke cut through all the structures to the prostate without injury to the urethra, prostate, rectum, or anal sphincter. Refrain from doing this in your first cases, but incise more carefully. Now enlarge the skin incision, if necessary, for the introduction of two fingers. Place suitable refractors (Fig. 2, *a*), one on each side, into the wound, and by blunt dissection expose the prostate, and with the depressor in the bladder it is forced into the perineal wound (Fig. 2). Open the capsule with knife or scissors in a transverse direction sufficiently to admit one or two fingers. *Place the retractors within the capsule.* This is important, because traction made on them drags the gland still further into the wound, and holds it firmly while enucleation and extirpation are being performed. It is experienced that by traction from below and depression from above the prostate is fixed within easy reach for its entire removal. Enucleate with the finger and bite away the portions thus liberated with the prostatic forceps (Fig. 1, *b*) until by piecemeal the prostatectomy is completed. Small, strong, blunt hooks may be used to advantage to drag the gland down. No effort is made to save the posterior portion of the prostatic urethra; indeed, injury to it cannot be avoided when the entire gland is removed. While *morcellement* is in progress it is always advantageous to advance the refractors farther within the capsule, and sometimes to introduce the middle finger into the bladder. The forceps can be rapidly thrust between the two fingers to the object to be removed without any danger to surrounding structures, for when the instrument is closed its end is perfectly smooth and round. The lateral lobes can be reached to any extent without damaging the mucous membrane of the bladder, and prostatic projections of the middle lobe are detected and removed without difficulty. Flush out the bladder very thoroughly with a weak antiseptic solution. A large stream of water should be used, for the ordinary irrigating toy only does harm. Mop out with gauze any water that is in the bladder and wound,

and introduce a drainage-tube (Fig. 1, *c*) surrounded with iodoform gauze (Fig. 3) through the wound into the bladder. A couple of stitches close the part of the skin wound not occupied by the tube, and at the same time prevent the gauze from coming out too soon. Remove the sponge from the rectum, place a comfortable firm dressing over the perineum, and retain it by a T-bandage. Now attach a long rubber tube to the external end of the drainage-tube, and the toilet of the operation is finished.

If the patient's urine has been scanty, or should he show depression or shock, then it is better to introduce two or three pints of normal salt solution, at a temperature not less than 115° F., beneath the skin while he is still in the operating-room than to wait until he is taken to bed.

Case I.—Mr. W., aged sixty-five years; farmer; German; referred to me by Dr. Pratt, of Goodland, Indiana, complaining of frequent, difficult, and painful urination. Temperature, 101° F.; pulse, 96, and respiration, 20. When he entered the hospital there was great desire to urinate, but he could not accomplish it. The urine, to the amount of twenty-four ounces, was drawn off through a soft rubber catheter, with surgical cleanliness. In three hours he had a chill; vomited; temperature, 102° F.; pulse, 120; and respiration, 24. The bladder was washed out with boric acid solution, and five grains of urotropin given every four hours internally. The next day he was as well as when he entered the hospital. The urine drawn off contained a large quantity of pus, was acid, and its specific gravity was 1010. It was ascertained that his bladder symptoms began ten years previously. The painful urination only commenced three months before; complete retention occurred three times during the last six months. In brief, he had the symptoms and signs of prostatic obstruction complicated with prostato-cystitis. Seven days were occupied with preparatory treatment. He was given light diet, calomel, strychnine, urotropin, salines, and enemata. The bladder was washed twice daily with a solution of chinosol, fifteen grains to the ounce of sterilized water. Each time, before the bladder

was irrigated he passed what urine he could, and then catheterized. During those seven days the amount of residual urine averaged eighteen ounces, and he voided about fifty ounces in all during each twenty-four hours. It contained pyogenic germs, pus, bladder cells, no sugar, and a trace of albumin. The temperature did not fall below 99° F. There was slight leucocytosis, no pain in lumbar region, and no tenderness elicited by prodding over the kidney nor by palpation. He could not bear firm pressure over the bladder. Through the rectum I could ascertain that the lateral lobes were tender and very large; the one on the left could be felt bimanually. The preparation relieved him very much, and the quantity of pus was very markedly reduced. No cystoscopic examination was attempted on account of the prostatitis and cystitis. His personal and family history was excellent. On the 20th day of November, 1900, I performed a median perineal prostatectomy. The whole prostate was removed with ease; the portions projecting within the bladder were reached without any difficulty. Some sections of the organ were so adherent to the capsule that the finger could not liberate them, but these were snipped away with the cutting forceps. The aid rendered by the depressor was valuable when dealing with the central lobe, which projected into the bladder fully an inch; at one time the instrument was turned end downward behind the prostate, and traction made on it, which brought the central lobe in view. The bladder was now washed out and a cystoscopic examination made. There was no injury done to the bladder, and the membranous urethra was not lacerated in the least, but the posterior portion of the prostatic urethra was taken away. The cystoscope was not of much use, except in seeing that the bladder was not traumatized. With my forefinger I could feel the large cavity from which the gland had been removed. He suffered no manifestations of shock whatever; had no vomiting; the highest temperature during convalescence was 99° F, and the highest pulse rate 98. The tube was removed on the seventh day.

The perineal wound closed on the fifteenth day, and he left

the hospital on December 11, 1900, just three weeks from the day of the operation.

Condition on Leaving. Walking about, urinating six times during the day and once at night. No pain or discomfort; no residual urine. Gaining in flesh, and feels happy. A few pus cells and bacteria still in the urine, and a trace of albumin. No casts. *Report two months later:* Working on his farm; no trouble in urinating, no pus in the urine, no albumin. *Report in six months later from Dr. Pratt:* Mr. W. died suddenly of angina pectoris. Was working at the time; had not complained of bladder symptoms.

CASE II.—Mr. E. B. F., aged sixty-nine years, also referred by Dr. Pratt, of Goodland, Indiana, entered hospital December 6, 1900, with a letter stating his exact condition. He complained of inability to pass water freely. The onset was tardy; the stream was slow, painful, and the urine dribbled. The quantity of urine passed the first twenty-four hours was only twelve ounces; it was acid, dark brown in color, specific gravity, 1021; urea, 2.5; albuminous; contained blood, pus, and cylindroids. The frequent urination began to be troublesome five or six years ago. His personal and family histories are very good. In order to increase the quantity of urine and improve its quality, all the water possible was administered by mouth, rectum, and subcutaneously. He improved every day; at the end of a week he voided sixty-eight ounces of urine, but it still contained pus and albumin. During preparations the residual urine varied between seven and sixteen ounces. The bladder was irrigated twice a day; urotropin and strychnine were given three times a day. With the attention given, so comfortable did he become that he almost backed out of an operation. The prostatic urethra was two inches longer than normal. The left lobe could be felt per rectum to be enlarged. With the cystoscope I could see the central projection and the tumor formed by the left lobe quite distinctly. The redness and granular appearance of the inflamed prostate were very distinct.

On December 14, 1900, I performed a median perineal

prostatectomy, and removed the entire left and median and about two-thirds of the right lobe, although it was normal. There was no shock. The next day his temperature was 100° F.; pulse, 70; and respiration, 22. The second day the slight fever had subsided. On the fifth day the tube and gauze were removed and replaced. On the sixth day temperature was 102° F.; pulse, 78; and respiration, 24. The gauze and tube were removed and left out, after which the constitutional disturbances subsided. On the seventeenth day the wound closed, and much to his delight he passed his urine *per vias naturales*, like a little boy. By this time it had increased to eight ounces, but it still contained some pus and a trace of albumin. He left the hospital on January 9, 1901, twenty-six days after the operation. He was then passing his urine every three or four hours during the day and twice during the night. A cystoscopic examination revealed a slightly reddened portion of mucous membrane at the neck of the bladder. Five months after leaving the hospital he came alone to Chicago with a carload of cattle, and called to see me. He stated that he was a new man. This gave me an opportunity to see him pass a full stream of urine with that ease and comfort which might be envied by a younger man. On passing a catheter no residual urine was there; this specimen of urine was normal. This gentleman had never used the catheter, but his physician had passed it for him occasionally the last couple of weeks before coming to the hospital.

Case III.—Mr. C. W. G. entered the hospital March 15, 1901, accompanied by Dr. Wagner, of Tacoma, Washington. He was complaining of inability to urinate naturally. The act of urination was slow, difficult, sometimes painful, and often impossible. The time occupied was often from twenty minutes to half an hour, and repeated efforts not infrequently were futile to pass any at all; then the catheter had to be used. Has had to get up six or eight times during the night, and during the day three hours is about the longest time he can go without trying to urinate. The quantity passed each time varied, but often only about an ounce was voided. He had had two years

and a half of catheter life. It is four years since his bladder trouble began. He remembered going to Victoria, B. C., to play golf, and held his urine too long, and after the game was over he had trouble to urinate. At that time the urine came slowly, with considerable effort; for a few years before this he had to get out of bed at night once or twice, but thought nothing of it, and after this he had more or less difficulty. He was steadily getting worse. In the fall of 1899 the prostate was enlarged with sounds of a suitable curve. In October, 1899, inflammation of the bladder and prostate nearly ended his life. During this illness he lost fifty pounds, and a slough of prostatic tissue came away. He then improved. Although he has had several attacks of irritation of the bladder, prostrating him for several days at a time, still he has had none so severe as in October a year ago. His personal and family history is excellent.

Physical Examination: He was passing only thirty ounces of urine, which contained pus, etc.; residual urine, twelve ounces. In four days this quantity was increased to seventy ounces, but residual was just the same. Urea, 1.2; specific gravity, 1014; contained pus; acid reaction. I made two cystoscopic examinations in this case—one two months before he came for operation, and again after he entered the hospital. The instrument passed into the bladder without difficulty each time; there was a deep groove posteriorly where the middle lobe had been, and from which it had sloughed away, as already mentioned. The prostatic urethra was nearly normal in length, but two large tumors could be seen closing the canal as the cystoscope was being removed. There was no cystitis, and I feared the pus came from one of the kidneys, but fortunately it did not. The central groove simulated that left after a Bottini operation, but much deeper and wider. Here was an excellent proof of urinary obstruction caused by enlarged lateral lobes. By a rectal examination the hypertrophy did not feel to be very large, although the size of two hens' eggs. On March 19, 1901, the operation was performed, and the two large lateral lobes and what was left of the central were

removed. Suffered practically no shock. He vomited a few times after the chloroform. The tube and gauze were removed on the fourth day, and left out. Bladder control was regained on the tenth day. At the end of two weeks he went out driving; the next day his left testicle was swollen and tender. The orchitis (not epididymitis) did not subside for ten days. On the twentieth day urine ceased to come through the perineum. The wound was reopened twice thereafter, and then closed permanently. It was six weeks before he left the hospital, at which time a few pus cells could be detected in the urine, but he completely emptied the bladder without pain or inconvenience. Reports since are to the effect that he feels as well as he ever did in his life.

Case IV.—Mr. M. A., Perry, Iowa, aged fifty-one years, referred by Dr. Mercer, of Chicago, entered the Chicago Hospital on April 3, 1901, complaining of (1) frequent and painful urination; (2) inability to work; (3) disturbed every hour or two of the night, and (4) a sudden stoppage of the stream occasionally. He suffered most excruciatingly. It was distressing to witness him having what he called "spasms." The pain in the bladder was constant and severe, but that in the urethra and at the glans penis was much worse. His trouble began eight years ago with the symptoms of stone in the bladder. The last year attacks of pain and fever would confine him to the house for days. The last two years he passed small uric acid calculi off and on, which he carried in his pocket. The urine has been scanty for three years. He was now passing sixty-four ounces, and there were eleven ounces of residual; specific gravity, 1020; urea, 1.5 per cent; blood, pus, albumin, and indican. Thompson's stone searcher was passed, and the stones felt and the clicking sound heard as they were tapped by it. Examination through the rectum was negative, no enlargement of the prostate could be felt, but the large amount of residual urine indicated obstruction. At the end of four days he was ready for the operation. He was then chloroformed, and cystoscopic examination made. The middle lobe protruded into the bladder. It was pear-shaped and

inflamed. It was with some difficulty that the stones could be seen by direct view. On April 7th I did the median perineal operation, removed the whole prostate and six stones. Although the lateral lobes were not much enlarged, I thought it wise to remove them to prevent further trouble. He suffered so much with spasms at the neck of the bladder after the operation that morphine had to be given freely. On the third day I removed the tube, with the hope of relieving him, but he suffered with spasms four days longer. He passed his water naturally on the fourteenth day, and left the hospital on April 30, 1901, in excellent spirits and health. There was no residual urine then, but pus was still present. On October 10th last he presented himself to show me how well he was. He was completely cured; urine normal, etc.

Case V.—Mr. P. C. H., aged sixty-nine; entered Chicago Hospital on April 19, 1901, complaining of difficult and painful urination. The quantity of urine varied from thirty to sixty ounces; of low specific gravity, 1002; urea less than 1 per cent.; contained blood, pus, and hyaline casts. Passed from two to four ounces at a time. On account of some fever (99° F.), and general weakness, he was in the hospital for twelve days before operation; during this time the pyrexia continued. Difficulty in urinating began sixteen years ago (1885), which he attributed to horseback-riding. In 1893 cystitis came on, and he has not been well since. The last year he expertly catheterized himself. He had several attacks of double epididymitis, and is now suffering from a chronic hydrocele that has been injected several times.

Operation on April 30, 1901. Through the perineum I made a very sweeping operation of the whole prostate gland in a very few minutes. The gland protruded in all directions. It could be outlined bimanually as a huge mass in the pelvis, the left lobe extending upward into the bladder, so as to be palpable. The prostatic urethra was two and one-half inches too long. The central lobe was nodular, three large nodules extending from it into the bladder. A more difficult case could not have been selected to test the scope of my procedure

via the perineum. I have also operated on the hydrocele. The tube was removed on the fourth day. On the twelfth day he sat up in a chair. Perineum closed on the twentieth day. Left the hospital on the thirty-third day after the operation. He has written that he has not been so well for years. When he left for home the urine was free from pus.

Case VI.—Mr. A. M., aged seventy-two years, carpenter, referred by Dr. Alexander, presented himself on March 12, 1901, complaining of incontinence of urine. He was wearing a rubber urinal to keep himself dry. In 1888 frequent urination and night disturbances began. For six years he managed to bear with his "weakness," as he called it. In 1894, after drinking too much spirits, and after going home about 12 o'clock at night, he failed to micturate. Toward morning he became so distressed that a doctor was called. He catheterized him. On two other occasions within a year the doctor drew off his urine. In the interval, outside of frequent acts, he felt all right. During the last two years he has been using a catheter somewhat carelessly, but without infecting himself. It was a silver catheter, No. 6, of English make, with a good curve. It was never boiled. He simply washed it with soap and water after using it, blew his breath through it, and put it back into an old leather case. He declared that before using it the desire to urinate was so urgent, he simply smeared vaseline or lard over it, and then relieved himself. Three weeks ago the urine began to dribble. It made him uncomfortable, so he bought the urinal. Since then he has only used the catheter about once a day. In the interim he allowed the urine to escape into the urinal.

After he had urinated two ounces I passed the catheter and withdrew thirty-six ounces of almost normal urine. I was surprised at this, because of the careless manner he used the catheter. The specific gravity was 1018; straw color; urea, 1.5; no pus, blood, or bacteria, nor casts, albumin, or sugar. He said that years ago he had passed some blood once or twice, but since he had learned to use the silver catheter his urine has been clear and normal in color.

On March 15, 1901, I removed through the perineum the two lateral lobes, hypertrophied to about the same extent, being about two inches in their longest diameter. On the third day I removed the drainage-tube from the bladder. He urinated through the perineum for a week, when about one-half the urine began to come through the penis. At no time did I deem it necessary to wash out his bladder. On the twentieth day after the operation the perineal wound was closed permanently, but it took him over an hour to empty his bladder. In the course of two months the contractile power of the bladder markedly improved, and it did not then take him over twenty minutes to empty his bladder, but still the abdominal muscles had to be used, and he had to strain in order to void all the urine. November 5, 1901, this gentleman is well and happy, passes his urine normally, but it is diminishing in quantity, according to his judgment. He stated that he knows the quantity is less, but did not think it necessary to measure it.

Advantages of the Operation.

1. It is the most direct route to the prostate.
2. Injury to the bladder is avoided.
3. The operation can be quite easily performed. Even in those cases where the gland has been repeatedly inflamed it is not as hard to remove it from below as from above.
4. It is an advantage to remove the gland piece by piece, for it enables the surgeon to work through a small opening without bruising the surrounding parts by the finger or a blunt instrument.
5. Hemorrhage is avoided so long as one is careful to work within the capsule. The hemorrhage in suprapubic prostatectomy or in the combined method is often very alarming. On one occasion the writer had to leave pressure forceps on bleeding vessels and pack the bladder tightly with gauze for twenty-four hours. The patient narrowly escaped death from both hemorrhage and sepsis. Sepsis and intoxication from

FIG. 1.

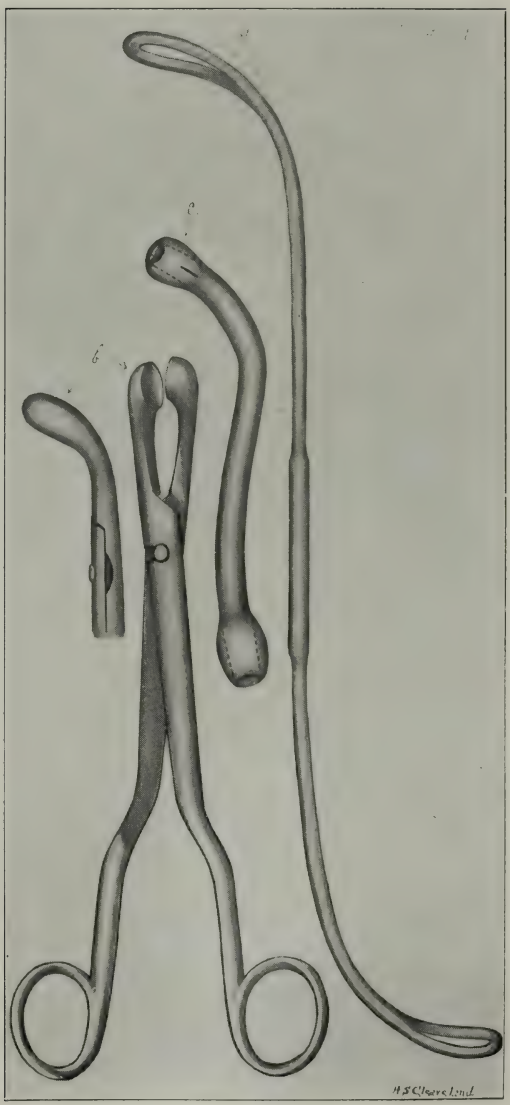


FIG 2.

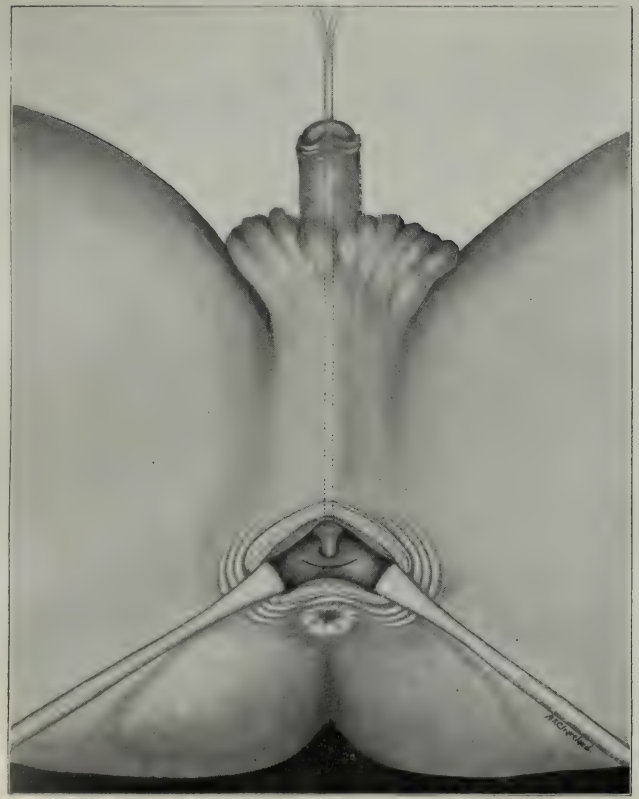
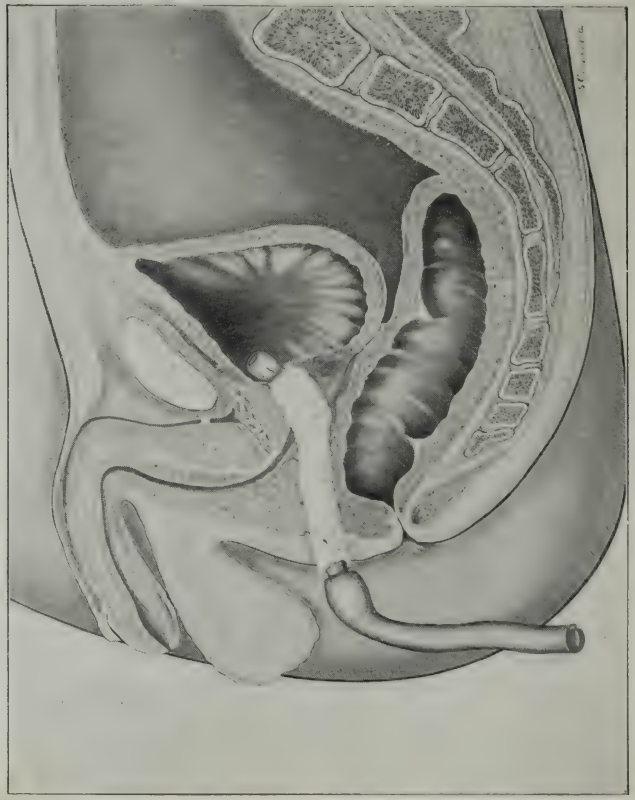


FIG. 3.



pus and fetid urine coming in contact with the prevesical tissues and wounded and raw surfaces within the bladder are sources of great danger within the suprapubic operation. The bladder may be opened in two stages, it is true, and the prevesical space thereby greatly protected; but the traumatism of the bladder over the prostate, even though done with a cautery knife, furnishes an opportunity for sepsis.

6. Perineal drainage is more complete.

7. The danger from septicæmia is not at all prominent after perineal prostatectomy, and so far has given no anxiety whatever, whereas more or less absorption of septic material is the rule in the suprapubic operation.

8. There is less danger of uræmia. The operation consumes less time, the short anæsthesia affects the kidneys less, and there being a minimum opportunity for sepsis, there is less work for the kidneys to perform. Uræmia is always to be dreaded regardless of the operation.

9. The perineal operation is accompanied by far less shock than the author has noticed following suprapubic prostatectomy.

While not unmindful of the fact that but six cases are here reported, still the results obtained in these six cases have been so satisfactory that I am encouraged to continue this method of operating, and also feel justified in recommending it to the profession.

Additional work on the prostate for hypertrophy of the middle lobe alone may be justly mentioned. In four cases, two complicated with vesical calculus, which I crushed, the central pathological lobe was removed in each through the median perineal section.

In four cases, viz., tuberculosis of prostate, which had had extended to it from the epididymis on each side, I removed the gland entirely through the median incision. In these cases the testicles were preserved. Through an incision in each inguinal region the epididymis and testicles were pulled up through it, the former carefully separated from the latter, the internal inguinal ring enlarged, the vas deferens followed

to the base of the bladder, and by blunt dissection a through-and-through communication with the perineal opening was obtained, which enabled me to extirpate the whole diseased track on both sides.

Double inguino-perineal, as well as vesico-perineal drainage is necessary in these cases.

DISCUSSION ON THE PAPERS OF DRS. YOUNG, McRAE, AND FERGUSON.

Dr. Robert T. Morris, of New York City.—I did not get here in time to hear the paper of Dr. McRae. I regard the paper by Dr. Ferguson as a very valuable one, and I have no doubt Dr. McRae's paper is equally so. I have witnessed various operations for the removal of the prostate by other men, and was one of the early ones to enucleate the prostate through the perineum by a single incision. There are one or two points in Dr. Ferguson's paper that are extremely important. First, the use of a retractor to pull down the capsule in some cases where it is difficult to do so. That is a very practical point, and I am glad to have it. With these retractors I could have saved some patients from prolonged operations and loss of blood if I had had them in my previous operations to pull down the capsule.

The matter of an incisor for the prostates that make a deep indentation of the bladder wall avoids some injury to the muscle. That is an important point also. Dr. Ferguson said that if we injure the muscle or muscles about the neck of the bladder we have difficulty afterward. Now, anything that will avoid injury to the bladder muscle is a step in advance, and one to which we should devote some attention. It occurs to me that one of the most vital points in the question of the removal of the prostate is how to avoid injury to the muscle. Pulling down the capsule with retractors is another step in advance. This, too, assists us in avoiding injury to the muscle at the neck of the bladder. I am glad to hear the doctor say that he does not divide the membranous urethra. I have never done it, although some authorities tell us to do so. I have not done it purposely, at any rate.

Is it necessary for us to drain the bladder with a tube after the incision has been made and the prostate removed? I have usually left out the drain. I may be wrong; if so, I want to

know it. Some of these feeble patients lack resistance, and I want to avoid anything that will injure them in any way. I have left out the tube in these cases, as a rule, and allowed the urine to drain through an opening, as in urethrotomy, and so far apparently without bad results, allowing the urine to come away when it pleases.

With regard to infection we seldom get infection, even from septic urine over recently exposed surfaces, because the bacteria of decomposing urine are not the chief bacteria of tissue infection. In all probability we may be able to do away with this bladder apparatus three or four days after the operation. Any way, I shall be glad to have Dr. Ferguson's opinion on that point.

Dr. Hugh H. Young, of Baltimore, Md.—I am naturally very much interested in the two papers that followed mine, and I would like to discuss a few points in them and also make some explanations in connection with my own paper. I do not wish to be understood as opposing prostatectomy, because I think it is a very useful and not difficult operation. That it is an easy matter to completely enucleate and remove the hypertrophied lobes, the following specimens from some of my cases show:

This specimen (demonstrating) is from a case in which I operated through the perineum. One lobe is of very large size, while the other is smaller. This prostate was so easily removed that I do not think the forceps of Dr. Ferguson would have been of much, if any, value. The advantage of enucleation is that by peeling the lobes out from the capsule you avoid considerable hemorrhage which comes from the substance of the gland when removed piecemeal. This second specimen is from a case in which two lobes were again removed from below, both by enucleation and also intracapsularly. I agree with Dr. Ferguson in regard to the intracapsular method, and his retractors appeal to me as being a distinct advantage in drawing the prostate into the wound and allowing easier access with the enucleating finger.

These other specimens which I have here have been removed through suprapubic incisions. In this one the enlargement consists of a great intravesical median lobe; in the others the median lobe is only slightly enlarged, but the lateral lobes are much hypertrophied.

The main question is this: What are you going to do when a case comes to you that is already in bad shape and urgently

needs relief? If we can get these patients early, or can persuade general practitioners who see these cases early that their prostates can be easily removed by a surgical operation and without danger, then we can do the operation recommended by Dr. Ferguson, or any of the other numerous methods, and remove them. But prostatectomy is not a safe operation in the very old or those seriously weakened by the disease, with large, flabby bladders and kidneys definitely damaged. There are a great many cases where we are compelled to do a Bottini operation or nothing at all. I maintain that the Bottini operation is perfectly satisfactory and safe, and is attended with very little mortality if good judgment is used. If cases are studied carefully and cystoscopically, if possible, and an accurate determination made of the conditions present, the Bottini operation will cure old men that prostatectomy would kill. If we get them early we can easily perform a suprapubic or perineal prostatectomy; it does not make much difference which. As a whole, I think the suprapubic method easier, quicker, no more dangerous, and alone applicable to those cases in which a very large median lobe is present, as in this case in which intravesical projection is almost four inches long. Another reason for the suprapubic operation is the great frequency with which calculus is present (in one-third of the cases in my series, both of prostatectomies and Bottini's).

Suprapubic drainage has long been considered one of the best treatments for chronic cystitis, and allows the large, flabby bladder to contract and regain its muscular tonicity. In enucleating the prostate through a suprapubic opening I have found the index finger of the left hand placed for counter-pressure into the rectum of the greatest assistance. The plan which I have followed for five years is as follows: Open bladder large enough to insert two fingers; pass a long-handled scalpel by side of finger into bladder, and carry its point into the posterior urethra; cut backward through the median bar or lobe; insert index finger of right hand into this opening, and, with the index finger of the left hand in the rectum, push the prostate upward. Proceed then to strip the prostatic lobes from the capsule and then from the urethra (in which a rubber catheter has been placed). In this way I have often removed in one piece the two lateral lobes, with the median bar connecting them. The enucleation often takes less than five minutes to perform. It is wonderful how

rapidly the large cavity which is left will collapse and heal over. Cystoscopic examination six weeks later often reveals only the smallest scar. The prostatic urethra appears to dilate and form a portion of the vesical cavity. I do not believe with Dr. Morris that any more of the prostatic periurethral muscle is saved after the perineal operation than after the suprapubic, for I think that a thorough operation by either route leaves nothing but the prostatic capsule and the thin urethral wall.

Dr. James T. Jelks, of Hot Springs, Ark.—I have been much interested in this work and in the papers that have been read. Several years ago I had the pleasure of hearing Dr. Alexander read a paper on prostatectomy, and Dr. Willy Meyer one on the Bottini operation. Dr. Eugene Fuller also discussed his method of removing the prostate. At a recent meeting of the Chicago Medical Society I heard Dr. Louis E. Schmidt read a paper on the Bottini operation, and Dr. Ferguson discussed the same line of work. The difficulty with me regarding the Bottini operation is that I do not know just what I am doing. Dr. Young may know. I like to see what I am doing. I like to see where my knife is going, so much so that I prefer a perineal or suprapubic section to the Bottini operation, because I know what I am doing, and I can see where I am going. I am more or less familiar with the statistics regarding the mortality following this work. I may not quote these statistics exactly, but the mortality from the Bottini operation has been 19 per cent, the mortality from castration has been 20 per cent., and from vasectomy it has been from 21 to 22 per cent. Dr. Ferguson has practically no mortality attending his operative work for this disease, and I take it the mortality in the work of others has been largely due to the anæsthetic. Some of these patients are very old, and if the Schleich method of anæsthesia were used there would probably have been a very low mortality. I am not personally familiar with the Ferguson operation, but the next opportunity I have I shall practice it. One can make use of the ordinary crusher for a depressor if he has not the Ferguson instrument. The first instrument he used, I believe, was the ordinary Bigelow crusher. With these retractors of Ferguson in a median incision, pulling the whole thing down, you have the prostate practically in your hand. I am in favor of Dr. Ferguson's operation over either of those that have been presented to us.

Dr. McRae (closing the discussion on his part).—I do not care to discuss this subject at any great length in my closing remarks. I am much interested in Dr. Ferguson's work. We have talked about this matter a great deal, and I was anxious to see the demonstration he has given of his operation. I cannot feel quite certain, however, that it is the best operation. I have some doubt in my mind as to that. While it may be an easier operation to do in a certain class of cases, I do not think it would be easier for me to do in the average case of prostatectomy that comes under my care.

Drainage of the bladder is a very important point. We do not get these cases when the urine is in a good condition. I have seen some cases where I had simply made a suprapubic opening in the bladder, and found the urine so highly infectious that the bladder and all the tissues with which the urine came in contact were absolutely green. I have seen these patients rendered septic from the urine where the operation did not take fifteen minutes. Such a state of things occurred in one case I had this spring. There was intense inflammation and enlargement of the prostate, with infection of the bladder, with subsequent sloughing of the prostate, apparently due to the infected urine.

Dr. Ferguson (closing the discussion).—I might say that a number of Chicago surgeons and surgeons outside of Chicago have sent for these instruments and are performing the operation.

With reference to drainage, I started in with the idea, brought out so well by Dr. Morris, of using drainage for a week or two or three weeks until I got rid of infection; but I found it gave so much disturbance at the end of a week that I had to remove it. I began to remove it earlier and earlier, until now I remove it on the third day. Patient has spasmodic pain, not in the membranous portion of the urethra, but at the neck of the bladder.

With regard to the enucleation of the prostate, it is quite easy in early cases, where there has been no inflammation; but if we take cases where there have been repeated attacks of inflammation the operation is attended with greater difficulty. The fibrous tissue is so firm and hard that you cannot break it down with the finger; hence enucleation is impeded. A cutting instrument must be used, such as the prostatome.

With regard to the removal of stones, I do not think I would

remove a stone the size of the one exhibited by Dr. Young through a perineal incision without crushing it first, because it would be quite unsurgical. I have lost one case following the Bottini operation. There is only a limited field for this operation, and that is in old patients with a central bar, causing the obstruction.

Perineal prostatectomy shortens the prostatic urethra, a result to be desired, as was pointed out by Dr. Belfield years ago.

FOREIGN BODIES IN THE ŒSOPHAGUS.

By J. W. Long, M.D.,
Salisbury, N. C.

A literal translation of the two infinitives from which the word œsophagus is derived would be "to carry what is eaten," but as a matter of fact many things not edible get into the œsophagus.

In 1880 Poulet published a two-volume treatise on *Foreign Bodies in Surgery*, in which he tabulated the various articles, from leeches to barbed wire, that have found lodgement in the œsophagus. Indeed, almost everything conceivable, from the end of a syphilitic patient's nose to a live fish, has been arrested in the gullet. These accidents usually occur in children and lunatics. It is an ever-present possibility in the mind of the anæsthetist, or should be. Even food may become impacted in the œsophagus as in one of the cases reported in this paper.

The presence of a stricture, pouch, or malformation increases the liability to these accidents.

A foreign body in the œsophagus carries with it both immediate and remote dangers. If lodged high up there will be dysphagia, retching, pain, and sometimes suffocation, as in a case seen by the writer two years ago in which an inch screw had entered point downward the upper end of the œsophagus of a three-months-old infant and impinged upon the trachea.

When lodged lower down the dangers are more remote and less remediable when once begun. Indeed, unless the foreign body be removed penetration or ulceration into some important viscus, as the pericardium, aorta, mediastinum or pleura, is almost

sure to result. The longer the object remains *in situ* the greater the dangers incident to its removal.

Anatomy. A brief review of the anatomy of the œsophagus will help to elucidate certain points.

According to McClellan[2] the adult gullet is 25 cm. or about ten inches long. Beginning in the median line, on a level with the sixth cervical vertebra, the œsophagus deviates a half-inch toward the left in the neck and returns slightly beyond the median line opposite the fourth or fifth dorsal vertebra, when it again bears toward the left, entering the cardia three-fourths of an inch to the left of the middle line opposite the ninth dorsal spine. There are three narrow places in the tube; at the upper end, at the bend opposite the fourth dorsal vertebra, at which point the left bronchus crosses it, and near the cardiac orifice where it passes through the diaphragm. Most anatomies and surgeries describe the upper end as the smallest portion of the tube. Gray's *Anatomy*, in the fifteenth edition, says "it is most contracted at its commencement and at the point where it passes through the diaphragm." But McClellan[2] says the lumen is least at the two lateral bends, measuring at these points 13 mm. or half an inch, and from 17 to 21 mm., or about three-fourths of an inch, throughout the rest of the passage. These measurements were made on the cadaver, and can be increased by forcible dilatation to 22 mm. in the narrowest portions and 36 mm. throughout the rest of the œsophagus. McClellan's measurements more nearly agree with the writer's observations, since only comparatively large objects are arrested at the upper end of the tube, while those small enough to enter are almost always arrested at one or the other of the lateral curvatures. Of course, a sharp or irregular object may find lodgement at any point along the gullet.

The reasons for the first lateral bend and constriction opposite the fourth dorsal vertebra are interesting. The curve of the spine is slightly convex anteriorly at this point, while the left bronchus crosses in front of the œsophagus and the aortic arch loops over just above the bronchus and to the left of the œsophagus in its passage to the posterior thoracic wall, all of

which tend to narrow the œsophagus and draw it to the right. There is a specimen in the Museum of the Royal College of Surgeons[1] which, if it represents the normal, will perhaps help to account for this bend. The specimen shows accessory bands springing from the muscular layer of the œsophagus and attached to the trachea just behind its bifurcation, which of course pull the œsophagus to the right.

While the Ilalian surgeon Guattani[24] as early as 1747, by experiments on animals and the cadaver, showed that there were no serious anatomical obstacles in the way of doing œsophagotomy, yet the relations of the œsophagus make the operation one not to be lightly undertaken.

Lying in close relation to the œsophagus are the trachea, left bronchus, thyroid gland, up to the second or third year the thymus gland, longi colli muscles, the left subclavian, left carotid and right pulmonary arteries, internal jugular and azygos major veins, the recurrent laryngeal and pneumogastric nerves, the thoracic duct, the pericardium, pleuræ, and intercostal vessels.

Removal of Foreign Bodies.

The removal of foreign bodies may be accomplished by

1. Emetics.
2. Manipulation through the mouth.
3. External manipulation.
4. Œsophagotomy.
5. Gastrotomy.

1. *Emetics* are useful in many instances, but are to be condemned when the nature of the object is such as to do damage to the œsophagus if the patient be made to retch violently.

2. *Manipulation Through the Mouth.* When the foreign body is located at the upper end of the œsophagus it is usually an easy matter to remove it by means of the finger, forceps, hooks, or probang. Exceptions must, however, be noted, since the object may be impacted or have such asperities as to make removal both difficult and dangerous. When lodged at the first bend opposite the fourth dorsal vertebra a foreign body may, as a

rule, be extracted with safety by means of some one of the many ingeniously devised instruments for the purpose. If an object passes to the diaphragmatic curvature the chances for safe removal by manipulation through the mouth are lessened, but still possible in many instances. The writer wishes to call special attention to what has already been said by a number of surgeons, that prolonged and unduly rough manipulations through the mouth are dangerous, even more so than œsophagotomy.

Case I.—Mrs. B., aged fifty-seven years, having lost all her teeth, was in the habit of bolting her food. While eating dinner, September 29, 1901, and dividing her attention between her food and some children at the table, she swallowed a piece of gristly beef which stuck in the gullet. She experienced great dysphagia, being unable to pass anything into the stomach; she also had decided pain and a pronounced sense of discomfort behind the sternum.

The writer saw the case with her physician, Dr. A. B. Goodman, about five hours after the accident. Because of the pain produced by manipulation chloroform anæsthesia was employed. An obstruction was found at the first lateral curvature. We finally succeeded in getting a bristle probang by the obstruction, but could not extract the piece of meat. An effort was then made to push it into the stomach, which was at least partially successful, as the probang and other instruments would pass with slight resistance into the stomach. It is possible that some damage was done to the œsophagus, as the patient suffered with considerable pain and soreness referred principally to the stomach, difficulty of swallowing, and rise of temperature for some days, but in the end made a good recovery.

3. *External Manipulation.* This method has been employed perhaps from time immemorial to remove foreign bodies lodged in the cervical portion of the œsophagus, but the following two cases go to show that smooth objects may sometimes be removed from the upper intrathoracic portion by external manipulation.

Case II.—Z. R., aged seven years, referred by Dr. T. T. Ferree, of Ashboro, N. C. On June 3, 1901, he swallowed a tin whistle that comes in a certain kind of penny candy package. The whistle was an inch in diameter and had lodged at the first lateral curvature. When seen by the writer the whistle had been in the œsophagus for five days. For the first few days the difficulty of swallowing was considerable, but this symptom had improved so much within the last twenty-four hours that the parents almost believed the whistle had passed into the stomach. The chief symptom when seen by the writer was an abundant continuous flow of saliva.

By means of the Röntgen rays the whistle was located without difficulty. It was impossible to engage the whistle with any instrument at command, and I had almost despaired of removing it without doing an œsophagotomy when a layman standing by said he had "removed a peach from a calf's gullet by stripping it up." Acting on this hint, and with the patient under chloroform, the shoulders elevated, and the head held slightly backward, I pressed my thumb and forefinger deeply into the soft tissues above and behind the sternum and was enabled to "strip" the whistle up into the pharynx, where it was easily removed.

Case III.—J. B., aged four years, residence Spencer, N. C., on October 25, 1901, swallowed a whistle similar to that described in Case II., which lodged at a corresponding point in his œsophagus. This little fellow, strange to say, suffered very little inconvenience from the presence of the whistle, but an increased flow of saliva was noticed. Through the fluoroscope the whistle was readily seen, and the accompanying radiograph was taken at this time. The whistle was removed the next morning in the same way as was the first one. It may be seen by reference to the radiograph that the whistle was well within the intrathoracic portion of the œsophagus, which is true of the other whistle case also.

4. *Œsophagotomy.* Œsophagotomy was first suggested by Verduc[24] in 1643, but it was not until 1738 that the operation

FIG. 1.

Tin whistle, one inch in diameter, in œsophagus of boy aged four years.

FIG. 2.

Open safety-pin in the œsophagus of a baby aged forty-five days.

FIG. 3.

(Esophagotomy wound ten days after operation. Patient aged forty-six days on day of operation.

was actually performed by Goursault, of Limousin. In the hands of modern surgeons the operation for the removal of foreign bodies is justly a popular procedure, though it must be regarded as a serious operation until the mortality is reduced from 22 per cent,[25] which is its best showing so far. Abdominal section never came into general favor till the mortality was reduced far below this figure.

Œsophagotomy may be regarded as the proper thing to do after reasonable attempts with instruments through the mouth and external manipulation fail, or the nature of the object or the condition of the œsophagus does not justify such manipulation.

Case IV.—G. L., aged forty-six days, female, residence Ramseur, N. C. This little patient measured twenty-three inches long and weighed nine pounds. Since about the 5th of June, 1901, the baby had seemed to have a cold, coughed and fretted a good deal, and had spells of heaving, choking, and sticking out the tongue. On June 15th the mother, while searching for the cause of the baby's distress, looked into its throat and was horrified to see a safety-pin there. She tried to remove the pin, but failed, it disappearing from view. June 19th two physicians saw the pin in the throat. They gave an emetic which caused emesis, but did not expel the pin. Chloroform was then administered and an effort made to extract the pin with instruments, which also failed. The pin again disappeared from view, evidently passing deeper into the œsophagus. Up to this time it had probably been in the pharynx. June 22d the baby was brought to the writer. Since the disappearance of the pin the fretting, heaving, and evidences of a cold had subsided, so that when seen by the writer the baby was apparently in perfect condition. The child was brought for consultation simply because of the solicitude of the parents. The Röntgen rays revealed the pin lodged in the œsophagus, open end up, the lower end as low down as the body of the fourth dorsal vertebra. The radiograph shows the lower end of the pin exactly in the median line, while the

open end inclines toward the left, demonstrating the turn of the œsophagus to make the first lateral curvature described when discussing the anatomy of the œsophagus. The span of the open end of the pin being 16 mm., the œsophagus of this young infant was either dilated to that extent or the point had penetrated the wall, probably the latter; and it is to be noticed that it was pointing directly toward the transverse portion of the aortic arch; in fact, the point lies in the aortic shadow. It may also be observed that the pin was entirely within the thoracic portion of the œsophagus. A careful consideration of this case convinced the writer that it was unwise for obvious reasons to even attempt to remove the pin by any method except an œsophagotomy. This was done the next day with the patient under chloroform, shoulders elevated, head thrown backward and turned slightly to the right side. It was of course necessary to do the low cervical operation. An incision was made along the inner border of the lower end of the left sternocleidomastoid muscle, dividing the soft tissues well down upon the manubrium, working obliquely downward and backward through the superior mediastinum. The extreme smallness of the parts rendered great care necessary in the dissection. The scalpel was used as little as possible after the first incision, and instead the parts were separated by a cautious use of the tissue forceps, scalpel handle, and finger. It is unnecessary to detail to this body the important structures encountered and avoided. On reaching the œsophagus and locating the pin a tiny opening was made directly over the head of the pin, which was caught with forceps and gently removed, following the arc of a circle during the withdrawal, the point of the pin being the last part withdrawn. This method of withdrawing the pin was considered important because it was felt to be almost certain that the point of the pin had penetrated the œsophageal wall, and was lying in such close proximity to the aorta that to pull the pin directly upward would probably cause the point to enter the aorta. The opening in the mucosa was closed by three interrupted catgut sutures, one tied internally and two externally; the muscular coat was also drawn

together by sutures, only the ends of the cutaneous incision were closed, the wound being packed gently with sterile gauze.

In conducting the after treatment a serious problem was encountered, namely, feeding the patient. Every surgery that could be found says feed by rectal enemata or a rubber tube passed by mouth or the wound. In the midst of the hot season, with a tiny baby, we felt that either plan would mean failure; so we simply followed Mother Nature's method and put the baby to the breast. That plan succeeded, and the baby recovered. The œsophageal incision leaked, as was to be expected, but fluids and air ceased to come through the opening by the thirteenth day, and by the end of the fourth week the external wound had entirely healed.

5. *Gastrotomy.* The writer has had no experience with gastrotomy for the removal of foreign bodies from the œsophagus, therefore will not presume to discuss it here.

Remarks. The first case reported suggests the possibility of doing damage with instruments used through the mouth, even though a reasonable degree of caution be employed.

The two whistle cases show what may be accomplished by external manipulation, even when the foreign body has passed into the thoracic portion of the œsophagus.

The safety-pin case is reported specially to put on record a successful œsophagotomy on perhaps the youngest patient for whom this operation was ever done.

Attention is also called to the almost entire absence of symptoms after a certain time in both the safety-pin and whistle cases.

The plan of putting the baby immediately to the breast deserves mention, since it is a departure from the established custom.

Without the Röntgen ray the safety-pin could hardly have been located and the whistles might have been overlooked.

A further reflection calls forth the query: in view of the absence of positive symptoms pointing to the œsophagus in

some of these cases and the only recent advent of the Röntgen ray, is it not possible that in the history of the human race many children have wasted and died supposedly from malnutrition when in truth there was an undiscovered foreign body in the œsophagus ?

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DISCUSSION.

DR. JOHN C. WYSOR, of Clifton Forge, Va.—I wish to report briefly a case in which a silver quarter lodged in the œsophagus of a child. The child was brought to me six days after he had swallowed the quarter. The little boy was unable to swallow anything, even water, on account of pain that was caused by it. Of course, I did not know where the foreign body was located; but, under chloroform, I took a rectal tube and carefully inserted it down the œsophagus, with the hope of locating the foreign

body in that way. I do not know the exact distance I put it down. As I attempted to withdraw it it held tight, and, giving the rectal tube a little jerk, the quarter was thrown up into the mouth. The fenestrum in the rectal tube passed by the quarter, which was in a vertical position, and caught the lower edge of it and threw it into the child's mouth.

REPORT OF A CASE OF GUNSHOT WOUND OF THE ABDOMEN.

By John C. Wysor, M.D.,
Clifton Forge, Va.

C. M., a colored laborer, aged twenty-six years, was shot by another negro at Quinnimont, West Virginia, on September 2, 1901, at 9 P.M. The ball, 38-calibre, entered about three-quarters of an inch above the left anterior superior spine of the ilium. He was seen by Dr. Hume, of Quinnimont, who applied a dressing to the external wound, expressing the opinion that the patient would die. He lay in a shanty all night, and early the next morning was put on a cot or stretcher and brought to Clifton Forge in the baggage car of a C. and O. fast train, a distance of 100 miles, arriving at 9 A.M., twelve hours after the infliction of the wound. He was then removed to the C. and O. Hospital by ambulance, a distance of one mile, over a pretty rough road. I had not been notified of the nature or rather the location of the wound, and consequently was not prepared to do an abdominal section upon the arrival of the patient, as I should have been had I known that he had been shot in the belly.

I proceeded, however, as soon as I was satisfied from his condition that I had to deal with a penetrating wound of the abdomen, to prepare for such an operation. The anæsthetic was administered about noon, fifteen hours after he received the wound. I first enlarged the wound in the skin, and with my finger as a probe followed the track of the bullet until I felt the opening in the peritoneum. I then made an incision in the median line below the umbilicus, which was afterward extended from a little above the navel to near the

pubes. The omentum was very short, not reaching as low as the umbilicus, and the coils of intestines presented immediately under the incision. The first knuckle picked up showed two perforations, which I immediately cleansed and closed with Lembert sutures, using fine chromicized catgut, and continued to close the openings as I came to them until I had sewed up nine perforations.

Following the gut still further, I found a portion seven or eight inches in length in which there were six more perforations. As some of these openings were very close together, I feared that in the repair of them I might constrict the gut or that there might be subsequent sloughing. For this reason, and also because I thought I could save time, I decided to excise that portion of the intestine, doing an end-to-end anastomosis by means of a Murphy button. A further search failing to reveal any further injury to the bowel, I washed out the abdominal cavity with large quantities of normal salt solution; leaving as much of the hot saline solution as possible in the cavity, I closed the abdominal incision, using layer sutures. I placed a small wick of gauze in the track of the bullet through the abdominal wall. (This was removed on the second day.)

From the time of commencing the administration of the chloroform till the patient was put to bed was three and a half hours.

His pulse at one time during the operation was 156 per minute, and I naturally concluded that we would have a funeral the next day, and that I would have to do a post-mortem to get my Murphy button.

I was much gratified, however, the next morning to find his pulse 120 and temperature normal. From that time on his recovery was uninterrupted. The button was passed at the end of the tenth day.

The chief points of interest in the case are the number of perforations from a single shot, the length of time after the reception of the wound until the operation was performed, and the distance travelled.

PENETRATING WOUNDS OF THE ABDOMEN:

WITH HISTORIES OF SIX LAPAROTOMIES AND STATISTICAL TABLES OF 152 CASES OPERATED ON AT THE CHARITY HOSPITAL, IN NEW ORLEANS, LA.

By E. D. Fenner, M.D.,
New Orleans, La.

It is the purpose of the present paper to record six of my cases of laparotomy for penetrating abdominal wounds, and to furnish the completed statistics of the Charity Hospital from January, 1892, when operative intervention was first attempted, to January, 1901. Although two of these cases here reported were unattended by any visceral injury, they are given with the others because of the near sequence in time and because the histories were at hand. I have myself operated upon many other cases, some of them successfully; but the old cry of imperfect records goes up from our own as from every other large hospital, and I have not the necessary data to report them.

Despite the high mortality, I think the indication for operation is pretty generally accepted now the world over. At the Charity Hospital we operate as soon as possible on all cases where penetration of the cavity has occurred *except* where, in the upper thoracic belt, it appears that on the left side the viscera have escaped injury and that upon the right that only the liver has been injured. These cases we generally leave alone unless there is evidence of severe internal hemorrhage, when, under suitable conditions, an attempt would be

made to get at the bleeding-point to secure hæmostasis by suture or packing.

The decision to operate is also influenced by the length of time which has elapsed since the wound was inflicted. After twenty-four hours operative interference is useless, and even after twelve hours the prospect of recovery is so small as to make the operation a doubtful procedure. Truth to tell, even under the best conditions, in gunshot wounds done with the ordinary large-calibre bullet, with injury of the intestines, the prognosis is so grave and the result so uncertain that we must approach these cases always with a certain amount of despondency. In spite of the most careful technique, and even after extensive experience, you can never tell, from the conditions found at operation, whether your patient will go on to recovery, will exhibit a rapidly fatal peritonitis, or develop a more gradual but equally mortal form of peritoneal inflammation. It seems clear, however, that an empty stomach and intestines undistended by gas are conditions favorable to recovery.

The deplorable termination of the case of President McKinley, which plunged the whole country into sorrow, has awakened new interest in the subject of gunshot wounds of the abdomen. The absence of vomiting and the cheerfulness of the distinguished patient had aroused the most sanguine hopes for his recovery; and yet the condition of the wounded organs at the autopsy showed that a fatal termination had been from the beginning inevitable. In our numerous post-mortems at the Charity Hospital upon such cases we have not infrequently found a somewhat similar condition of affairs—little or no peritonitis, but gangrenous areas about the lesions in the bowels, apparently due to the contusing effects of the bullet upon tissues possessing too little vitality to recover from the shock. These cases had survived several days, often with little distention or vomiting, but with some temperature, and always with an anxious expression and a *rapid pulse*, that great danger signal in all cases of abdominal wounds.

Let me now briefly relate the histories of the cases I have to present:

Case I. *Stab wound of abdomen; omentum protruding; excision of omentum; laparotomy; recovery.*—C. B., negro man, aged twenty-one years, was brought in on the ambulance on February 8, 1900. He had received a stab wound of the abdomen, through which a piece of omentum was protruding. He was immediately prepared for operation, and, under chloroform, the protruding omentum was ligated and cut off. The wound was enlarged to permit inspection of the cavity. A large amount of blood was found in the upper part of the abdomen, and the incision was still further enlarged to permit freer examination. No lesion of the viscera, however, was discovered, and after thoroughly flushing the belly the incision was closed with through-and-through sutures of silver wire. The man was sent to bed in good condition. At the end of thirty-six hours the bowels were moved well, and after an uneventful convalescence he was discharged on March 7, 1901.

Case II. *Gunshot wound of left lumbar region, penetrating abdomen; three perforations of colon and a graze wound of stomach; laparotomy; enterorrhaphy; recovery.*—John L., colored, male, aged sixteen years, was brought into the hospital on the ambulance about 3.30 P.M. on February 27, 1900, with a gunshot wound of the left lumbar region; there was no wound of exit. The boy had eaten a hearty meal and drunk a great quantity of claret, and there was much vomiting and some shock. Nothing characteristic about the vomited matter. Tenderness and pain referred to the region of the wound. As soon as the abdomen could be prepared celiotomy was done about three hours after the injury.

Operation, under chloroform: Incision, about eight inches long, in the median line. A considerable quantity of blood was found in the cavity, with some particles of matter from the bowels. The bullet had perforated the descending colon twice, very near the splenic flexure, and inflicted a third

wound, which cut through the serous and muscular coats, but did not penetrate the mucous membrane. The bowel was comparatively empty, and there had not been much escape of fecal matter. One of the perforations involved the mesenteric attachment, and some difficulty was had in properly securing it. The location of the wounds made them somewhat inaccessible, and necessitated the large abdominal incision.

The stomach, in spite of free vomiting, was half-full, and presented at the cardiac end a wound of the serous and muscular coats, but with the mucous membrane intact. This, like the wounds in the intestine, was closed with Lembert sutures of fine silk.

The bullet had evidently ranged upward and forward, but we were unable to discover where it had gone after striking the stomach.

The abdominal cavity was thoroughly flushed with hot normal salt solution, a good deal of which was left in the cavity, and was then closed with through-and-through sutures of silkworm-gut. The bullet wound in the back was sealed with cotton and collodion. Operation from beginning of anæsthesia to completion of dressing occupied one hour and a half. Patient went to the ward in good condition.

Clinical Notes. First day. No vomiting followed operation. No pain was complained of on recovery from anæsthesia. The patient was very tractable, lying perfectly quiet and sleeping most of the time. His nervous system did not appear to be highly organized and sensitive, which no doubt was a favorable condition.

Water in tablespoonful doses and cracked ice were allowed during the night. Hypodermic stimulation of tinct. digitalis, three minims, and strychnine sulphate, one-ninetieth grain, every four hours. Ice-bag to abdomen.

Second and third days. Moderate tympanites developed, causing patient to complain that bandage was too tight; this subsided slowly during the next two or three days. Vomited once during the night of third day.

Fourth day. Up to this time nothing but water and cracked ice had been given. Milk-punch, Ducro's elixir, and beef-tea in half-ounce doses, alternating every two hours, were now allowed. Vomited once.

Fifth day. Strained orange-juice and chicken-soup added to diet.

Sixth day. No movement of bowels up to this time. Sodium phosphate, one and a half drachms in solution, every two hours, for five doses produced two copious movements. No pain resulted. Abdominal dressing changed.

Seventh day. Sodium phosphate, one and a half drachms, three times a day. One large movement.

Eighth day. Hypodermic stimulation discontinued. Wound dressed. Several stitch abscesses found. Bowels moved. *A considerable quantity of arterial blood passed.* No pain or bad symptoms resulted. Morphine sulph., one-eighth grain, fluid extr. ergot, one-half drachm, by needle. Ice-bag to abdomen. Food stooped.

Ninth and tenth days. No food. Nothing special to note.

Eleventh day. Another movement of bowels, with a second hemorrhage. Ice-bag. Morphine and ergot given.

Twelfth day. Stitches removed. Small abscess around them.

Thirteenth day. Feeding resumed. From this time recovery was uninterrupted. Bowels moved every second day. Diet was gradually increased in quantity and variety. Stitch abscesses were dressed frequently, and by the twentieth day abdominal wound was entirely well.

Twenty-sixth day. Patient up and out of bed.

Thirty-second day. Discharged, cured.

Special Features. No food until fourth day. Hemorrhage from intestines on eighth and eleventh days.

For the excellent record of this case I am indebted to Dr. Carroll W. Allen, at that time the interne of the service.

Case III. *Gunshot wound of right buttock, penetrating abdomen; one perforation of bowel, one of bladder; laparotomy; enterorrhaphy; suture of bladder; recovery.*—C. H.,

negro man, aged twenty-seven years. Well nourished and muscular. Has had syphilis and several attacks of malaria. A free drinker. On Christmas day, 1900, at about 6 P.M., while standing at a grocery bar, he was fired on by an old enemy, the ball entering the left side near the tenth rib and coursing along the bone to lodge beneath the skin near the left costal arch, causing only a superficial wound. The patient turned to escape, when a second shot struck him in the right buttock. After being wounded the second time he walked two squares to his home, when the ambulance was summoned and conveyed him to the hospital.

On examination I found the second ball just beneath the skin above the pubes, and urine drawn with the catheter contained blood. He was immediately prepared for operation, and, under chloroform, an incision was made over the bullet, which was extracted. The cut was extended to open the cavity and permit examination of the bowels and bladder. Very little blood or urine was present in the belly, but in going over the intestines I found a perforation of the ileum, which was closed with Lembert sutures of fine silk. The bladder wound was now searched for. It proved that the ball had struck the very summit of a partially distended bladder, making only one hole in the viscus. This was closed by a double row of Lembert sutures. The cavity was well washed out and the peritoneum carefully sutured. The incision in the skin and muscles was now closed with silkworm-gut, except a small portion at the lower end, into which was inserted a wick of iodoform gauze. Patient returned to the ward in good condition. Hypodermic stimulation ordered and the catheter to be used every two hours. After twenty-four hours, catheterization only every four hours. On the morning of third day he had a hard chill, followed by fever, and later in the day another chill. These were plainly urethral, from irritation by the catheter, and its use was discontinued. He had no difficulty in voiding the urine voluntarily. On third day bowels were moved by an enema, and thereafter every second day, unless evacuation

occurred unaided. The stitches were removed on the twelfth day. He never exhibited any symptoms of peritonitis, and was permitted to sit up in bed on the fourteenth day. On January 14, 1901, he was discharged, perfectly well.

CASE IV. *Gunshot wound of left hip; eight perforations of intestine; laparotomy; enterorrhaphy; recovery.*—John P., negro man, aged twenty-seven years, was shot about 10.30 P.M. on May 11, 1901, and sent to the hospital in the ambulance. Examination showed that the ball had entered the left hip, about one and a half inches above and half an inch in front of the trochanter major. Vomiting and extreme pain and tenderness over the abdomen indicated that the bullet had passed through the ileum and entered the abdominal cavity. He was at once prepared for operation, and, under chloroform, the belly was opened in the median line, below the navel. Much blood welled up through the incision, and when the bowels were gone over eight perforations of the ileum were found and sutured. In this case, owing to the number of the wounds, I tried the continuous Cushing suture, using fine silk, and, when the apposition was not perfectly satisfactory, running back over the first line a second row of sutures. Some of the holes I closed with the usual Lembert stitch. I must say I was pleased with the Cushing suture. (In the next case in which I used it, however, my patient died, so that it cannot be considered as having any special life-saving properties of its own.) After repairing all the wounds in the bowel the abdomen was thoroughly washed out with salt solution and the incision closed with silkworm-gut. Patient went to the ward in good condition.

Second day. Somewhat restless, but not nauseated. Hypodermic stimulation. Ice-bag to belly. Cracked ice by mouth. In the evening Ducro's elixir in teaspoonful doses tried, but soon discontinued because of slight nausea.

Third day. Ducro, milk-punch, beef-tea, in 2-drachm doses.

Fourth day. Nourishment increased to one-half ounce at a time. Hypodermic stimulation stopped, and strychnine, one-thirtieth of a grain, given by mouth every four hours.

Sixth day. Patient has been doing so well that nourishment has been increased to two and a half ounces every two or three hours. Temperature has not been above 99.6° F., but this evening went to 102° F., and he complains of pain in the left side of belly. Salol, five grains, every four hours.

Seventh day. Temperature normal.

Eleventh day. Patient is now on full liquid diet. The bowels have not moved since he was shot, but he has frequently passed large quantities of gas. Sodium phosphate, one drachm, in milk, every four hours.

Thirteenth day. Phosphate has not yet moved the bowels. Eight ounces of olive oil given by enema.

Fourteenth day. Enema of soapsuds (hot) containing Epsom salts, one ounce, has at last produced a copious action. Another enema the next day had an equally good effect. From now on the bowels moved regularly every day.

Seventeenth day. Stitches removed.

Eighteenth day. Discharged, perfectly well.

Case V. *Incised wound of abdomen; escape of intestines; laparotomy; recovery.*—Philip R., white child, aged four years, admitted on ambulance May 4, 1901. This little fellow was walking down the steps, carrying a glass, when he slipped, dropping the glass, which was shattered. He fell forward upon the broken pieces, one of which inflicted a wound in the rectus muscle, penetrating the abdomen, through which about a foot and a half of intestines escaped. Fortunately he was not interfered with until the ambulance arrived, when the surgeon in charge wrapped the bowel in sterile gauze and rapidly transported the child to the hospital. Under chloroform the abdomen was cleansed, the protruding intestines washed with hot saline solution, and replaced in the cavity. The wound was now enlarged, and it was positively determined by examination that the bowels were intact. The abdomen was flushed and the wound closed with catgut in tiers. The child was not in the least shocked when he reached the hospital, and he stood the operation splendidly. Convalescence was so uneventful as to require no comment.

Case VI. *Gunshot wound of thorax, penetrating abdomen; wound of diaphragm, spleen, stomach, and liver; splenectomy; suture of diaphragm, stomach, and liver; recovery.*—Anderson L., negro man, aged twenty-seven years, was brought in on the ambulance on September 8, 1901, with a gunshot wound of left thorax, about the level of tenth rib, in the axillary line. Abdominal pain and tenderness, with vomiting of blood just after he was shot, made it plain that operation was demanded. He was immediately prepared, and, under chloroform, the belly was opened in the median line from the tip of the sternum to below the navel. A large quantity of blood was found in the upper abdomen. When this was sponged away, and the intestines got out of the field by gauze sponges, the spleen was seen to be bleeding from a large hole blown through it by the bullet. The spleen was removed as quickly as possible—no easy task with a normal organ—and meanwhile the bleeding was partly controlled by pressure with the fingers. When the spleen was got out of the way a large hole in the diaphragm could be seen, through which the air was rushing in and out with a loud noise every time the man breathed. The lung was, of course, collapsed, but the patient took the anæsthetic very well. The hole in the muscle was closed by two silk sutures, and our attention was now turned to the stomach. A good-sized hole was found in the cardiac extremity; but, fortunately, though the muscular and serous coats were badly hurt, only a very small opening had been made in the mucous membrane, through which none of the stomach contents had escaped. This wound was closed with Lembert sutures. A laceration of the under surface of the left lobe of the liver was secured by two silk sutures. The ball, after hitting the liver, had dropped back, and was found in the folds of the gastrocolic omentum. All blood was now got rid of by flushing and the abdominal wound closed with silkworm-gut.

During the operation the patient was badly shocked, and I was obliged to change from chloroform to ether, give hypodermics of brandy, digitalis, strychnine, and atropine, and

infuse two pints of saline solution into the vein at the elbow. He went to the ward depressed, but next morning had entirely recovered from the shock.

Second day. 6 A. M., temperature, 98.5° F.; pulse, 98; respiration, 40; vomiting. 9 A. M., temperature, 99.1° F.; pulse, 80; respiration, 48; vomiting. 12 M., temperature, 99.1° F.; pulse, 88; respiration, 48; vomiting. 3 P. M., temperature, 99.1° F.; pulse, 86; respiration, 40; vomiting. 9 P. M., temperature, 99.1° F.; pulse, 82; respiration, 42; vomiting ceased.

Third day. 6 A. M., temperature, 100° F.; pulse, 100; respiration, 40. 6 P. M., temperature, 103° F.; pulse, 120; respiration, 45. High enema, one pint comp. inf. senna, resulted in a good stool.

Fourth day. 6 A. M., temperature, 103° F.; pulse, 98; respiration, 50. 6 P. M., temperature, 102.1° F.; pulse, 98; respiration, 40.

Fifth day. 6 A. M., temperature, 101.5° F.; pulse, 88; respiration, 36. 6 P. M., temperature, 103.6° F.; pulse, 88; respiration, 40. Ducro by mouth retained.

Sixth day. 6 A. M., temperature, 100.5° F.; pulse, 88; respiration, 36. 6 P. M., temperature, 100° F.; pulse, 86; respiration, 36.

Seventh day. 6 A. M., temperature, 100.3° F.; pulse, 80; respiration, 40. 6 P. M., temperature, 101.3° F.; pulse, 86; respiration, 37.

Eighth day. 6 A. M., temperature, 101° F.; pulse, 85; respiration, 40. 6 P. M., temperature, 101.5° F.; pulse, 110; respiration, 35.

Temperature has been due to pneumothorax and pleurisy on the left side and a pneumonia which developed on the right side, but owing to fear of disturbing him was not diagnosed until September 14th. He has complained a great deal of pain in the chest and annoying cough, for which, in addition to an ammonia mixture, we have had to use morphine several times.

On September 18th temperature reached normal. A slight

exacerbation occurred on the 19th, but quickly subsided, and from that time recovery was rapid. He was discharged, perfectly well, on September 30th, having been up about the ward for three days.

On September 17th he was delirious for a time, and got out of bed and walked the length of the ward. This seemed to have been the crisis of his lung trouble, for the next morning his mind was perfectly clear, and he began to get better.

The records of the Charity Hospital show that from January, 1892, to January, 1901, we had performed laparotomy for penetrating wounds of the abdomen 152 times, with 87 deaths, a mortality for all cases of 57.23 per cent. Morton (1889) collected 110 cases, with a mortality of 62 per cent.; Coley (1890), 165 cases, with a death-rate of 67.2 per cent.

Of our 152 cases 113 were for gunshot wounds, with 78 deaths, a mortality of 69 per cent.; and 39 were for stab wounds, with 9 deaths, or 23.07 per cent.

Distributed by years, our percentages are as follows:

ABDOMINAL SECTIONS.

		Total.	Died.	Mortality.
1892.	Gunshot wounds	9	5	55.55 per ct.
	Stab wounds	2	0	0 "
1893.	Gunshot wounds	10	6	60.00 "
	Stab wounds	5	3	60.00 "
1894.	Gunshot wounds	11	7	63 63 "
	Stab wounds	5	1	20.00 "
1895.	Gunshot wounds	13	10	76.92 "
	Stab wounds	4	0	0 "
1896.	Gunshot wounds	24	16	66.66 "
	Stab wounds	5	0	0 "
1897.	Gunshot wounds	15	13	86.66 "
	Stab wounds	7	2	28.57 "
1898.	Gunshot wounds	11	7	63.63 "
	Stab wounds	3	2	66.66 "
1899.	Gunshot wounds	14	11	78.50 "
	Stab wounds	5	1	20.00 "
1900.	Gunshot wounds	6	3	50.00 "
	Stab wounds	3	0	0.00 "

Taking, now, the cases which at operation presented lesions of the viscera, we find them distributed as follows:

		Total.	Died.	Mortality.
1892.	Gunshot wounds	9	5	55.55 per ct.
	Stab wounds	0	0	0 "
1893.	Gunshot wounds	9	6	66.66 "
	Stab wounds	0	0	0 "
1894.	Gunshot wounds	9	7	77.77 "
	Stab wounds	1	0	0 "
1895.	Gunshot wounds	12	10	83.33 "
	Stab wounds	0	0	0 "
1896.	Gunshot wounds	21	14	66.66 "
	Stab wounds	3	0	0 "
1897.	Gunshot wounds	12	11	91.66 "
	Stab wounds	4	2	50.00 "
1898.	Gunshot wounds	9	6	66.66 "
	Stab wounds	1	1	100.00 "
1899.	Gunshot wounds	12	11	91.66 "
	Stab wounds	0	0	0 "
1900.	Gunshot wounds	3	1	33.33 "
	Stab wounds	0	0	0 "

This table shows 105 cases of gunshot wounds and stab wounds of the abdomen operated upon with visceral injuries, of which 74 died, a total mortality of 70.47 per cent.

Of these 105 cases with injuries of the viscera 96 were gunshot wounds, of which 71 died, a mortality of 73.95 per cent.; and 9 were stab wounds, of which 3 died, a mortality of 33.33 per cent.

In spite of the high rate of mortality shown by these tables I do not think they should discourage the operation. A mortality of 73.95 per cent. in gunshot wounds *with injury of the hollow viscera* means, in my opinion, that 26 per cent. of these patients had their lives saved by the operation; and a death-rate of 33.33 per cent. in stab wounds, with the bowels cut, means that two-thirds were saved from certain death.

I am impressed by the fact that you can never tell from general symptoms or external appearances whether the viscera have been wounded or not. I recall one case of stab wound

where I was strongly tempted to let the patient alone, but did make up my mind to operate. I enlarged the wound, and, still impressed by the idea that the weapon had done no serious harm, examined only three or four feet of the bowel that were nearest the wound. Finding no injury, I sewed the cut up and sent the man to bed. He did very well for two days, when he suddenly had a change for the worse, and died in a few hours, of violent peritonitis. The autopsy revealed a clear cut through the bowel, just beyond the point at which my inspection had stopped. Since that time, now some two years ago, I count time well spent in going over the bowel carefully, and I feel that every penetrating wound of the abdomen should be given the benefit of an operation. Still another case, which was brought in about September 10, 1901, has further impressed upon me the necessity for operation if the case is seen in time. This man had been shot about the pubes thirty-six hours before his arrival at the hospital. Peritonitis was already developed, and no attempt at interference was made. Opium was given freely and he lingered four or five days. When the body was opened after death *no injury* of the viscera was found, but the bullet was found lying in the pelvis, together with some fragments of bone from the pubes, and the whole belly was the seat of a violent septic inflammation. Does it not seem probable that if he could have been treated in time, according to proper surgical principles, that the bullet would have been found, the pieces of bone removed, and, with sound intestines, the inflammation caused by the dirty bullet prevented? This case, while cited here, is not included in any of the tables, which deal only with those cases upon which laparotomy was performed.

For the records of the cases reported and for their devoted attention to the patients, I feel that my thanks are due to Drs. Allen and Granger, and Messrs. Richards, Cobb, and Lynch, who were at different times the internes in charge of the cases.

DISCUSSION ON THE PAPERS OF DRS. WYSOR AND FENNER.

Dr. George S. Brown, of Birmingham, Ala.—During a discussion on this subject at the New Orleans meeting Dr. Douglas quoted me as saying that we had a thousand abdominal gunshot wounds in Birmingham, and I stated that I did not wish to convey any such impression. I said that we had kept no records of all the cases, and that out of perhaps a thousand gunshot wounds we had the usual percentage of abdominal injuries; I do not know how many there were. The cases were particularly fatal when operated on, and in discussing the subject several times since I have been regarded as a pessimist in regard to operating. There is a good deal to be learned about gunshot wounds of the abdomen. I am firmly of the opinion that the majority of cases have died from shock following operation—not from peritonitis. I am not at all satisfied that shock is not in some measure contributed to by the operation on top of the injury. I have operated on seven cases, all of whom died except one. This patient would probably have died from peritonitis, as a piece of cloth was found in the abdominal cavity. He suffered very little from shock. Two other cases I operated on immediately, sewed up the wounds in the intestine, and one of them lived a week and died from an obstruction of the bowel at the point of suturing. Failure in this case was due to faulty technique. Notwithstanding all of the statistics that have been gathered, a lower mortality is shown for those cases not operated on. I recall only one case (my own) reported in our Association that recovered with operation, while about twenty have recovered without it. I have seen two fecal fistula cases due to pistol shot which recovered without operation. At the same time, undoubtedly, those cases that recover with operation seem to have been saved by the operation, so that this question is very puzzling. I have operated on every case that has come along and have done the best I could, but we have the statistics of the New Orleans meeting before us every day. I believe there were fifty-two cases reported there in the pre-operation days, with twenty-six recoveries without operation. Those were cases of gunshot wounds of the abdomen. Another point to be considered is that the cases operated on are the selected cases. A great many

patients with gunshot wounds of the abdomen die instantly or within a few minutes, and many are taken into the hospital who are dying when brought in, and an operation is not thought of, and yet they go to swell the mortality lists of those not operated upon. I have seen a dozen or fifteen of this class of cases myself. The mortality from the statistics quoted at the New Orleans meeting was 50 per cent. without operation; whereas the mortality from operating on gunshot wounds of the abdomen was 69 per cent. Leave out the extreme cases, and the mortality from non-interference will be 15 to 25 per cent. less.

Dr. W. L. Rodman, of Philadelphia, Pa.—I have been greatly interested in the papers of Drs. Wysor and Fenner. I think we are all interested, more or less, in gunshot wounds at the present time. I will state that this is also to be the leading subject for discussion before the Surgical Section of the American Medical Association next June. The officers of the section have chosen it.

I wish to congratulate Dr. Wysor on the successful termination of his case. I think there were a larger number of perforations in his case than many of us have reported. I operated on one case years ago in the Louisville City Hospital in which there were nine perforations. Otis, in his *History of the War of the Rebellion*, stated that a soldier was shot through and through while defecating on the battle-field, there being eleven perforations made. I think Dr. Wysor showed good judgment in resecting a part of the gut rather than attempt repairing so many openings close together.

I desire to commend the excellent paper of Dr. Fenner, who reports the largest number of cases in one hospital I have heard of or known. It is an interesting report, indeed.

As to the points made by Dr. Brown, they are good ones. There is no question about the fact that we are beginning to think of gunshot wounds of the abdomen in a different way than we did a few years ago. This is due to the fact that military surgeons particularly have made us keenly alive to the importance of the subject. Soldiers on the battle-field are oftentimes shot through and through with the small modern rifle ball, and yet they recover. This was the result of the observations of Senn, Parker, Nancrede, and practically all surgeons in the war of this country with Spain. It has been unanimously testified to by the English surgeons in the Anglo-Boer war still going on. Treeves and Sir

William MacCormac took positive grounds against surgical intervention in gunshot wounds of the abdomen. Undoubtedly many supposed perforating wounds of the abdomen are recovered from, as will be seen from the official reports of General Sternberg and also from the reports of the English army surgeons. But, in the first place, as to how many of these supposed penetrating wounds of the abdomen were necessarily visceral wounds, we are in the dark. Admitting there were wounds of the stomach or gut, one can easily understand how nature can repair them when made by a ball thirty-hundreds of an inch in diameter. It does not cause anything like so large a wound as that made by a larger bullet. Furthermore, soldiers in battle are oftentimes found in the most favorable condition for the repair of such wounds, because their stomachs and intestinal canals are practically empty, on account of the fact that they may have been starved for some hours before going into action, and because a large percentage of them have diarrhœa, more or less, all the time, conditions which favor comparative emptiness of the gastro-intestinal tract. The principal difference is due to the size of the ball and its great velocity, which makes it cut like a knife; it does not bruise tissue, and it need not, therefore, be followed by extravasation. What are the conditions made by the pistol ball? In the first place, the larger calibre ball is made of lead instead of steel; it goes with a low velocity; it bruises and devitalizes tissue everywhere, and is practically certain to be followed by extravasation. So, admitting the position of military surgeons to be correct, we cannot admit that non-intervention or a masterly inactivity, as they advise, is the proper stand to take in civil practice. I am sorry that the statistics are not better from the Charity Hospital of New Orleans than they are. I take the same ground Dr. Fenner does, and, although they have lost 75 per cent., still they have saved 25 per cent., and practically all such cases would have died unoperated.

I think Dr. Brown raised a good point as to the time of operation. I think myself it is best to operate upon pistol-shot wounds of the abdomen, even if patients are in profound shock. For to what is the shock due? It is due to hemorrhage. Without hemorrhage there will not be any great amount of shock, in my judgment; and, if you wait until the subsidence of shock, you probably wait until the patient dies. Therefore, I believe, differently from him, that the time to operate in cases of that kind

is as soon as you can get at them in a well-equipped hospital. On the battle-field, where there is much congestion along the firing line, with inadequate facilities in field hospitals, and where wounds are made by a small ball which cuts like a knife, much may be said in favor of non-intervention; still, in civil practice I believe the sooner these cases are operated on the better. The mortality, I think, depends very largely upon the time when the operation is done; statistics clearly show that. Although quite old, the statistics of Coley of 1889 show clearly that the largest percentage of cases will get well if operated on during the first twelve hours. Cases get well, even if operated on as late as forty-eight hours. I have one successful case that was operated on fifty-one hours after being shot. Two men were shooting hogs on a Friday morning, at 9 o'clock, and one of them accidentally shot the other. I operated on him Sunday at 12 o'clock. He had general peritonitis, and I feared that he would die on the table. In fact, I told his brother that he might die on the table, and I only did the operation from a sense of duty. The man made an excellent recovery, although there were two wounds of the gut and considerable fecal extravasation, and one of the most marked conditions of general peritonitis that I have ever seen. Operations do good when they are performed as late as thirty-six or forty-eight hours after the injury. I would insist upon early operation in all pistol-shot injuries of the abdomen. On the battle-field conditions are different, and one can afford to counsel in favor of non-intervention.

Major Owens, of Fort Thomas.—I believe operation should be done as early as possible. It was my good fortune, perhaps, to be in the Philippine Islands in 1898. One of my friends performed an operation on a soldier for several perforations of the intestines. The operation was done in a tent, and was made with the surgeon standing in water half-way up to his knees, and his patient recovered. He did the best he could under the circumstances and conditions. Modern bullets do not inflict so much injury as did the older bullets. I think the general impression is that it is due largely to the fact that the more swift moving ball penetrates the tissues much more rapidly. The tissues, therefore, absorb less of the force made by the ball, and the injuries to the tissues are due to the amount of force of the ball which is absorbed by the tissues themselves. The bruising is due to that. I am in favor of performing these operations as

early as possible and under the best conditions that we can get. With us these operations have been done largely in tents.

Dr. Manning Simons, of Charleston, S. C.—I am very much interested in the subject of gunshot wounds of the abdomen, and I have done laparotomy twenty-six times for such injuries, with success in 20 per cent. of the cases.

At the New Orleans meeting, in the debate on Dr. Grant's paper, I stated that I had been very much disheartened with the results that I had attained.

I had the privilege of being present at the first laparotomy performed, I believe, in this country, after it was suggested, for penetrating wounds of the abdomen. The operation was performed by Dr. R. A. Kinloch at the Roper Hospital, in Charleston, S. C.

I am inclined to believe that many of those who were present at the meeting in New Orleans when Dr. Grant's paper was read are not now so sanguine as they were at that time in the matter of statistics, because those statistics presented by Dr. Grant have not been improved upon since.

There are one or two practical points in connection with laparotomy for gunshot wounds of the abdomen to which I desire to call attention. First as to the question of shock. It is a most remarkable thing, and yet, nevertheless, true, that an individual who has received a gunshot wound of the abdomen often presents very little shock.

Many of my patients in the hospital were colored people who came from phosphate works in the neighborhood, and we have had numerous gunshot wounds of the abdomen among them. These people come in often with penetrating wounds of the abdomen, presenting absolutely no evidence of shock.

To see them on the operating-table one would scarcely believe that they had been the recipients of so serious and dangerous an injury as a gunshot wound of the abdomen. On the other hand, cases come in with pronounced shock, and it has been suggested that perhaps many of such cases have terminated fatally because they were operated on before there was a reaction. You are well aware of the discussion that has gone on in relation to operating for perforations in typhoid fever before reaction from shock.

I apprehend that in the majority of cases the shock we see in these cases of gunshot wounds is due to hemorrhage. In this connection I would mention a case upon which I operated last

summer. The patient was a Norwegian sailor who was shot by the captain of his ship, the ball entering to the left of the umbilicus and a little below. When the man was brought in he had very little evidence of shock.

On opening the abdomen I found a vessel as large as the radial bleeding freely.

Another point to which I wish to draw your attention—and doubtless you have thought of it as I have—and that is the responsibility that rests upon a surgeon in a case of gunshot wound of the abdomen, especially as we see these cases in civil practice, the wounds having been produced by pistols.

A man is brought into the hospital without any signs of shock. You have no means of positively determining whether there are visceral injuries, and the question presents itself to us whether to operate or not.

I remember on one occasion having the case of a negro shot by a white man. I recognized the fact that he ought to be operated on. The friends of the man who did the shooting demanded that the injured man be not operated on. This patient finally recovered without operation, although visceral complication was proved by the occurrence of a fistulous communication with the small intestine. This fistula gave vent to undigested food, but finally healed. The man is in good health to-day.

Under these circumstances the surgeon has to contend, on the one hand, with his convictions as to the indications for operation, and, on the other hand, with public opinion as well as the opposition of those most interested in the case.

Another point to which I desire to allude particularly is that it is not all penetrating wounds of the abdomen that have visceral complications, and that few of us are able to say, no matter what may be our experience, that complications are present, as the symptoms by which they can be determined are very uncertain. We, therefore, sometimes open the abdomen and find no visceral complications.

There is no doubt that laparotomy under such circumstances has a positive mortality of its own, a mortality independent of the lesions produced by the missile.

There are some cases of penetrating wounds of the abdomen that have recovered without operation, and there are recorded cases of such wounds of the abdomen without visceral complications that have died after operation. The surgeon, in deciding

upon his duty, lies between Scylla on the one hand, and Charybdis on the other.

I wish to call attention to another point, namely, that the idea seems to be generally accepted that wounds in the abdomen above the belt line should be let alone, because they are not likely to be accompanied by visceral complications. My limited experience with these wounds teaches me that, while we are less apt to have visceral complications in these cases, yet they frequently occur. I have in mind a boy who was shot in this region, a little above and to the left of the umbilicus. The accident occurred at a place thirteen miles from Charleston, and he was brought to the infirmary in a buggy.

In this case I found and repaired two perforations in the stomach. I feel sure that this boy, who made an uninterrupted recovery, would have died had no operation been done for the repair of the visceral injury. The boy's recovery was probably due to his own determination of character. He was sixteen years of age. He did not swallow a drop of liquid or a particle of food for nine days. I nourished him by the rectum. When thirsty he rinsed his mouth with water. He is now eighteen years of age and a fine specimen of manhood. I did not have the X-ray at command and made no extended search for the ball, which probably lodged in the muscles of the back, and has given no trouble.

Another point is with reference to the line of incision. As a general rule, in text-books we are told that the incision should be made in the median line; but if the orifice of entrance of the missile is at the side of the median line, to open in the line of this orifice. In one of the cases to which I have alluded I followed this method and made an incision, bisecting the orifice of entrance of the ball. The man was very muscular, and I had to cut through nearly three inches of muscle before I reached the cavity.

I have never had a more laborious job than to get in and out of that man's abdomen. Hereafter in such a muscular patient I shall make an opening in the median line, and if necessary close that up and go over to the side.

There is one other point I wish to allude to particularly; it is that one of the elements of failure is the overlooking of perforations. The disinclination on the part of the operator to eviscerate or disembowel his patient in the search for perforations is so great that he often slurs over his work.

In the case of the sailor to which I alluded I examined foot after foot of the intestine, until I came to the conclusion that the man had no visceral complication. At the very end of my search, and I was about to give it up, I found two perforations in the small intestine. I came near overlooking these.

So far as the repair of perforations is concerned, I may say that I have seen sixteen perforations in the intestines and mesentery in the same individual. I have closed up sixteen perforations that were made by one ball passing from before backward through the abdomen below the umbilicus.

I wish to call your attention to a fallacy, because it is taught in some text-books, namely, that where a ball enters and passes from side to side, or more or less obliquely, through the abdomen below the umbilicus, one will find from five to fifteen perforations. I operated on a case some time ago in which I knew the wound was penetrating, the ball passing in the direction mentioned, and I felt justified in believing that there were perforations. I opened the man's abdomen and did not find a perforation, although the pelvis was full of blood. He made a good recovery.

I have resected as much as two feet of the small intestine and made anastomosis with Murphy's button, on account of perforations involving a considerable portion of the intestine.

I shall continue to perform these operations for gunshot wounds of the abdomen, because I believe the work is in the right direction. I must confess, however, so far as I have seen, good results are not as numerous as the bad, and it is rather disheartening.

I am quite satisfied that the chief elements for successful aseptic results in laparotomy for penetrating wounds of the abdomen are, first, aseptic dressing of the abdomen immediately after the wound has been made, and, secondly, early operation.

Some of the cases that were brought to me from the phosphate mines, at a distance from Charleston, had peritonitis before they reached the hospital. These cases were almost hopeless when first seen by the surgeon.

The earlier the surgeon opens the abdomen in cases of penetrating gunshot wounds of that cavity, the better the chances for the patient. I did not drain in my cases usually.

Generally, except in cases of peritonitis, I wash the cavity out thoroughly and close the wound. I do not favor drainage in abdominal operations if it be possible to avoid it.

NEPHRO-URETERECTOMY: A REPORT OF TWO CASES.

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The subject of nephro-ureterectomy is not so well known as to require an apology from a reporter of an operation of this kind before a congregation of surgeons even so learned as these present. The number of reported cases to date is but a dozen, and it is only by carefully reporting cases as they occur, with thorough study of them, that the proper indications and methods may be determined. It is with a view to assisting in this good work that I to-day report a case of partial and a case of complete nephro-ureterectomy. Since reporting a case of complete ureterectomy to this Association two years ago, together with a *résumé* of the literature on the subject, my interest in it has not lessened.

The report of my two cases follows:

Case I. *Nephrotomy, followed by incomplete nephro-ureterectomy for pyonephrosis, adrenal tumor, and pyo-ureter; extraperitoneal operation; recovery.*—Mrs. F. S., white, aged thirty-eight years, was seen with Dr. Roman, of my city, February 16, 1900. She had had five children, the last of which having been born seventeen days previously. The preceding autumn she had had chills and fever, which did not yield to the administration of quinine, but continued to time of labor. With the beginning of the chills she noticed a "tumor" to the right of the womb, which was very painful and prevented her from getting her usual sleep. During labor Dr. Roman had discovered the mass in the region of the right kidney and

her temperature to be 102° F. The labor had been normal, but the fever had continued, ranging from 100° to 104° F. Believing he was dealing with a suppurating kidney, I was called. At this visit I found a small, emaciated woman, weighing about eighty pounds, having a temperature of 102° F. and a pulse of 130; her skin was very dry and tongue furred. A mass, of about the size of an average-sized infant's head, was notable in the region of the right kidney. Nephrotomy was advised, and she was sent to Columbia Hospital for Women for that purpose. The urinalysis made the following day showed as follows: color, brownish-yellow, heavy sediment, acid reaction; specific gravity, 1023; a trace of albumin was present; urea, seven grains to the ounce; pus cells abundant; no casts or tubercle bacilli were found. No ureteral catheterization was resorted to, as the patient was very ill, and a nephrotomy at least seemed urgently necessary, which was done on the 19th, opening seven pus pockets in the kidney and cutting away a piece of the organ for microscopical examination. The operation required but a few minutes, and was done during extreme stimulation, yet death was barely averted. The pulse ranged from 136 to 160 at the time, and nothing more than emptying the pus collections was to be considered. Destruction of the kidney structure seemed universal. The temperature returned to normal, the pulse dropped to less than 100, and she improved materially, though pus continued to come freely from the loin wound. The day after nephrotomy the urinalysis report was: quantity for twenty-four hours, twenty-one and a half ounces; reaction, acid; 2 per cent. of albumin present; no casts or blood, but pus present. The quantity gradually increased to more than thirty ounces, having occasionally an alkaline reaction and nearly always a trace of albumin and pus. On March 10, 1901, the temperature and pulse rapidly raised to a dangerous point, though the wound was discharging large quantities of pus. Two days later I removed the kidney and ureter to the middle of the pelvic portion. The kidney was found to be very much smaller,

and contained a few pus pockets. No urine had leaked through the drainage track since the nephrotomy. About the middle of the pelvic portion of the ureter was found a mulberry calculus, with diameters varying from three-eighths to five-eighths of an inch, completely blocking its lumen. The peritoneum was slightly opened in two places during removal of the ureter, and they were immediately closed with running catgut. Daily examinations of the urine from the time of this operation to April 4th showed a gradual decrease in the abnormal elements, and a complete absence of them at the time of her leaving the hospital, April 6, 1901.

Dr. James Carroll, U. S. A., examined the specimens removed and reported on them as follows: "The kidney is the seat of a chronic interstitial inflammation, probably a pressure nephritis. The pelvis is lined by a wall of granulation tissue. In the cortical substance beneath the capsule and in the deeper structures there are sharply circumscribed and diffused areas, composed of large polygonal epithelial cells, whose protoplasm is filled with fine fat droplets. They are usually arranged in single rows, separated by a delicate stroma, and appear to be aberrant adrenal growths originating from embryonal remnants. In the gross specimen these areas were sharply circumscribed and of a distinctly yellow color. The kidney is dotted with yellow masses of new-growth, and the same growth appears on the capsule." The ureter was much thickened and dilated above the site of the calculus.

Case II. *Nephrotomy, followed by complete nephro-uretër-ectomy for pyonephrosis and pyo-ureter; extraperitoneal operation; recovery.*—Mrs. J. E., white, aged about twenty-seven years, had been troubled with vesical tenesmus, with purulent urine, at intervals for about three years and dating from an attack of apparently renal colic. At her labors she was in a much weakened condition, probably from this cause, though having no fever. Her husband, an intelligent and careful physician, with special qualifications for such work, had made a great many urinalyses without ever finding any

indications of renal or ureteral involvement other than a faintly acid urine containing pus, but no kidney or ureteral epithelium or tubercle bacilli. Bladder irrigation was frequently employed, much to the discomfort of the patient, but always affording relief. She was in moderate flesh, but very pale and anæmic. At the time I was summoned to see her, which was six months after the birth of her last and only living child, she complained of pain and an enlargement in her right loin and stiffness of the right side of the body. An examination revealed a mass, irregular in shape, having diameters varying from four to eight inches. Urinalyses made daily for about a week revealed nothing abnormal in the urine but pus. Palpation revealed nothing abnormal on the left side, and nephrotomy was planned. She was sent to Providence Hospital, December 12, 1900, where, on the following day, this operation was done. Five pus pockets in the right kidney were evacuated and drained, about twenty ounces of pus being removed. Three tubular calculi were removed from the upper portion of the ureter, but the very feeble condition of the patient prevented further ureteral exploration. Just after this the record of the urinalyses shows that the daily quantity was twenty-two ounces, having a yellowish-red color, with a heavy sediment, a specific gravity of 1026, acid reaction, $\frac{1}{6}$ per cent. of albumin, many pus cells, a few red blood cells, and bladder epithelium. December 22d, hyaline casts and some pus; daily quantity, thirty ounces, and the reaction acid. Granular and hyaline as well as epithelial casts were continued for some time, with a normal amount of urea and a good specific gravity. Up to January 8, 1901, the quantity varied from twenty-seven to thirty-six ounces, was always acid, and contained a trace of albumin, a few pus cells with casts, and calcium oxalate crystals. No odor of urine was ever detected about the loin wound, and it was thought the kidney function on that side was permanently lost. She left the hospital January 9th, with a discharging sinus in the track of the wound. Her general condition was greatly improved, and she was able to

walk about. Occasionally she came to my office to complain of the annoyance incident to the discharge from the sinus. Early in March she had some fever and malaise, with no evidence of lessening of the discharge. I recommended removal of the diseased structures, and she re-entered the hospital for that purpose March 17, 1901. An examination of the urine just before operation was reported as follows: specific gravity, 1017; reaction, acid; albumin, 10 per cent.; urea, ten grains to one ounce; squamous epithelium and leucocytes. Centrifuged well, and could find no casts; some pus was noticed. The pus was thought to be from the right ureter, as the urine was acid, and the absence of casts indicated a good condition of the left kidney. As no urine had escaped from the wound, I had only to consider the general condition of the patient in deciding the advisability of the operation. March 18th, in the presence of my friend Dr. Wallace Neff, I removed the kidney and ureter through a long lumbo-ilio-inguinal incision, which was a continuation of the former one and extended to near the spine of the pubis. The kidney, much shrunken, contained three pus pockets. The ureter contained pus, and was very much thickened and enlarged as far down as the broad ligament. By stretching the lower part of the wound with strong retractors I was enabled to remove it in entirety. The broad ligament was forcibly split and lifted up by careful traction on the ureter. The portion passing through this ligament was practically normal in size and consistency. It was severed just at the bladder junction, and not ligated. In my former paper I noted the danger of this procedure and recommended ligation in all cases. This is in conformity with authorities on this subject, but I am confident it is necessary in but few cases. Drainage through gauze brought out of the wound was liberal for a few days. The subsequent changes in the urine were an increase in the amount of urine, the presence of epithelial, granular, and hyaline casts, beginning two days after the operation and disappearing on the twelfth day, a few red blood cells, and an occasional blood cast, with a

trace of pus, for a few days immediately following the operation. April 21st she left the hospital, with some discharge from the wound. June 17th, urinalysis by her husband: quantity in twenty-four hours, about 40 ounces; specific gravity, 1021; solids per 1000 c.c., 50 grammes; urea, 20 grammes; considerable albumin; no sugar; no casts; a few epithelial cells and amorphous urates.

Dr. James Carroll, U. S. A., the pathologist, reports his examination of the specimen as follows: "Atrophy of the kidney structure, with obliteration of nearly all evidence of tubules. It consists almost entirely of newly formed fibrous and granular tissue, which shows purulent infiltration and miliary abscesses. The ureter shows miliary abscesses in the submucosa and the outer layer of connective tissue. The lumen is not affected. The infection was probably carried by the lymph channels."

In both of these cases I had to deal with idle kidneys, and in both nephrotomy was as much as could have been done at the first attempt. Both patients are now perfectly well, which speaks volumes for the advisability of the operation.

Indications. The principal reason for nephro-ureterectomy is tubercular disease of both of these structures. Malignant disease and severe traumatic injury throughout most of the course of the ureter, multiple marked strictures from ureteritis, and marked destruction of the kidney and ureter from calculous pus accumulations—especially the last—are other conditions indicating the operation. Le Dentu removed them for a papillomatous growth of the bladder at the ureteral orifice. It is doubtful, however, if the average surgeon would be willing to sacrifice a kidney for that condition. After nephrectomy for pyonephrosis, from various causes, a sinus connecting with the ureter frequently continues to discharge for a long time, and requires a secondary partial or complete ureterectomy. In some cases like this the whole has been removed secondarily, and the surgeon has again been obliged to resort further to exsection. When tubercular disease has descended from the kidney along the ureter the

actual extent of the progress along the duct is not easily demonstrated at the time of the operation, and removal of a large portion or all of the duct is advisable. When this disease has passed from the bladder through the ureter to the kidney, and so involved the latter organ as to make its removal appear necessary, little hope of cure can be entertained with retention of the ureter. In fact, in this condition bladder extirpation will probably be required, though the condition of the opposite side must be excellent to justify any surgical intervention beyond emptying pus. Frequently in calculous pyonephrosis the ureter will be partially or completely obstructed by a calculus and the condition of the duct above it materially altered. In such case, if the kidney must be sacrificed, it is best to remove the ureter to below the calculus and to explore the remainder, which may be allowed to remain if not evidently diseased or obstructed; otherwise this portion, also, had best be removed. It happens in most cases of tubercular kidney that the disease has spread along the ureter, usually by the mucosa, occasionally by the lymph channels, and manifests itself in the bladder mucosa about the ureteral orifice. This would seem particularly to indicate complete nephro-ureterectomy, but in many cases where the involvement of the duct has been slight no trouble has followed simple nephrectomy. I am inclined to believe that further experience with nephro-ureterectomy will lead to complete removal of the ureter with the kidney in these cases. Whether resort to nephrotomy should not precede nephro-ureterectomy or even nephrectomy is an unsettled question, though the French surgeons have decided it in the negative. In tubercular or malignant disease the earliest possible removal of the organs should be done; in all other conditions I am of the opinion that nephrotomy should be first tried, as often cure is brought about by it; and frequently the kidney is not all diseased, but is capable of doing good work when the pus is removed. This is frequently proven in early pyonephrosis from ureteral calculi. It may be even in better condition than its fellow. It may be entirely destroyed, on the other

hand, as demonstrated by the absence of urine from the loin drainage. Of course, when such is the case the opposite kidney has already adjusted itself to the extra work imposed upon it, and the surgeon need not fear on this account if removal of the functionless kidney and the ureter is deemed advisable. It may not be out of place here to refer to a few points regarding differential methods in diagnosis by bladder and ureter exploration. If a pyonephrotic kidney be non-functionating there may yet be a discharge of pus from the corresponding ureter into the urine from a healthy fellow-kidney. In such case the presence of a mass on the diseased side, together with pyuria, offers a presumptive diagnosis of unilateral disease. If the diseased kidney be excreting urine, pus may be the only abnormal material found in it. Should the urine offer other evidence, as tube casts, this presumption is not so great. The diseased kidney may be the origin of the casts, tubercle bacilli, etc., or part may come from the supposedly healthy kidney. Casts may come from the opposite kidney as a result of increased function, and do not necessarily contraindicate operation on the diseased kidney. The amount of urine affords no evidence whatever as to the functional power of the diseased kidney. The Harris seggregator in most cases offers a plan for collecting the urines from the sides separately, which permits estimation of the relative amounts of the two sides without entering the ureters —a matter of some importance at times. To pass a ureteral catheter through a bladder that has been holding pus for some months into a healthy ureter is liable to carry infection. Catheterization of the ureter on the diseased side may be done with perfect safety. If this is done and the bladder washed, then urine taken from the bladder must be from the other side, and will offer an index to the state of that kidney, while the ureteral catheter is furnishing evidence as to the diseased side. Nephrotomy does afford an opportunity of approximating the amount of urine coming from the diseased kidney and from the opposite side; and subsequent analyses of the urine from the bladder, compared with those before

operation, offer a fair method of arriving at a conclusion as to the condition of the fellow-kidney.

Methods and Technique. As reports of operations for removal of the kidney and ureter and of the ureter alone appear, the modifications of former methods are exhibited. Early in the history of the operation the two principal methods were the loin extraperitoneal and the transperitoneal. The former was considered preferable, as ureterectomy, and especially nephro-ureterectomy, was done nearly always for tubercular disease, pus being present in nearly every case. To avoid contamination of the peritoneum with these materials seemed strongly advisable. Up to the time of preparation of my paper in 1899 eighteen cases of ureterectomy and nephro-ureterectomy had been done by this route as against one by a combined loin extraperitoneal and vaginal and one by the transperitoneal route. Of the eighteen operations by the extraperitoneal route (loin) complete nephro-ureterectomy had been done twice in males and once on a woman. Complete ureterectomy had been done twice in males, twice in females, and in one case the sex was not given; incomplete nephro-ureterectomy had been done six times in females and once on a man, and incomplete ureterectomy had been done once on a male and twice in females. By the combined loin extraperitoneal and vaginal one complete nephro-ureterectomy had been done and a partial one on a woman by the transperitoneal route.

Since that time I had the pleasure of witnessing a complete nephro-ureterectomy by a combined loin extraperitoneal and vaginal method by Montgomery, and have had access to reports of two of the same character by Noble, of Atlanta, and Ill, one by Le Dentu by the lumbo-ilio-inguinal, two incomplete ones by Lennander and Tait by the same route, three complete operations by Baldwin and one by Pryor by the transperitoneal route, seven total ureterectomies by Meyer and Israel, and one partial one by Tait by the extraperitoneal route, and a complete ureterectomy by the loin extraperitoneal and vaginal routes by Garceau.

These make to date by the extraperitoneal route five cases of complete nephro-ureterectomy, including my own, nine of incomplete nephro-ureterectomies, complete ureterectomy twelve cases, and incomplete ureterectomy four. By the loin extraperitoneal plus the vaginal four complete nephro-ureterectomies and one complete ureterectomy. By the transperitoneal route complete nephro-ureterectomy has been done four times and incomplete nephro-ureterectomy once. Thus, of forty ureterectomies thirty of them have been done by the loin extraperitoneal route alone; by this route plus the vaginal five, and by the transperitoneal five. Of the complete nephro-ureterectomies five have been done by the loin extraperitoneal route, by the loin extraperitoneal plus the vaginal four, and by the transperitoneal route four. This record shows that ureterectomy has been done without crossing the peritoneal cavity in 88 per cent. of the cases, and that total ureterectomy by the transperitoneal route has been done but four times of the eighteen operations. This demonstrates that the transperitoneal route has not been adopted for this work.

It is scarcely allowable in this connection to consider the mortality-rate, as very likely all the fatal cases of nephro-ureterectomy were in individuals who had suffered with a tedious and devitalizing pathological process calling for operation; but as a surgical proposition *per se* the transperitoneal route certainly has dangers of infection that do not belong to the extraperitoneal. Baldwin is very emphatic in his advocacy of its superiority, and Pryor prefers it. Most operators prefer the extraperitoneal route. I am sure Montgomery's and my three cases would have been very dangerous ones to have attacked from the peritoneal side, as pus was abundant, and soiling the peritoneum could hardly have been avoided. Kelly, Noble, Montgomery, and Ill recommend the combined loin extraperitoneal and vaginal plan for complete nephro-ureterectomy. This is probably due to their desire not to injure the broad ligament and their hope of avoiding it by the vaginal work, a desire to have vaginal drainage, and a belief in the necessity of ligating the lower

end of the ureter. The last is really not necessary unless the ureterovesical junction be involved, which is not usual except in severe tubercular conditions. If this part be not involved, even ligation of the stump is not advisable. But two cases—those of Meyer and Hartmann—are reported in which reflux of urine into the stump of the severed ureter are reported. In both of these this junction was much thickened, and prevented a proper pressure being exerted here to prevent outflow of the bladder contents. In such cases exsection of that portion of the bladder is often advisable. The entire removal of the ureter may be done by the lumbo-ilio-inguinal route, as one of my cases demonstrates, though some injury to the broad ligament must necessarily attend it. The advantages of this over the combined routes mentioned are the danger of infection and the duration of the operation are lessened. Following this procedure the drainage is all in one direction, and reaches the surface in a region in which it is most easily managed. The advantages of the vaginal incision are greater facility in dealing with the terminal end of the ureter, which may include partial exsection of the bladder, as in Le Dentu's case, and downward drainage, though some operators have not considered this latter an advantage, for they have promptly sutured the vaginal roof opening.

Most operators employing the combined routes have begun at the renal end, making the vaginal incision very late in the operation. Montgomery made this opening first, having in view ligation and division of the bladder end of the ureter and facilitating upward removal by traction. Another modification he made was in employing the Konig incision in the loin. Removal of the kidney and ureter proved, with him, an operation of but a very few minutes. Ill removed the kidney through a loin incision, dissecting the ureter well down, and made a second incision in the semilunar line, just above the pubes. Through this he pushed back the peritoneum until the iliac vessels were reached, continuing the dissection of the ureter to the iliac artery. He tied the uterine

artery anterior to his finger and the internal iliac posteriorly, opening the vagina along the line of the ureter, which was completely loosened. The ureter was finally cut in two after ligation and the lower part drawn into the vagina, where it was ligated next to the bladder and severed. Meyer uses Israel's incision. Noble removed the kidney and ureter in one piece, separating the kidney and upper portion of the ureter from the loin opening, and, after severing the lower end through the vagina, pulled it upward and out of the loin wound. Tait removed the lower part of the ureter through an anterior extraperitoneal opening, the same as Kelly and Ill. Baldwin and Pryor prefer the transperitoneal route. The former makes button-hole openings in the peritoneum over the ureter long enough to insert two fingers, and closes them with suture after the ureter is removed. Pryor operates through the semilunar line, draws the ureter in front of the uterine cavity, inverts three-quarters of the ureter stump into the bladder by means of a probe passed through the urethra. In his case the probe was passed over the pubes, the ureter sloughed, and the probe was withdrawn in the third week.

Note. Since writing this paper I have learned of a successful transperitoneal nephro-ureterectomy following nephrotomy for tuberculosis done by R. S. Cathcart (*Tristate Medical Association Transactions—Carolinas and Virginia*, 1900, p. 272).

DISCUSSION.

Dr. George H. Noble, of Atlanta, Ga.—I have been very much interested in Dr. Bovée's paper. He has presented the subject admirably and has given us a very valuable contribution. There are two or three points I am particularly interested in. To start with, I will say that out of a number of nephrectomies I have only had one complete nephro-ureterectomy, but three partial ones, removing four or five inches of the ureter. The question of ligating the ureter is the first point that attracted

my attention. In most of the cases I ligated it; in one it was left open and packed, resulting in no leakage whatever. The portion of the ureter that was left was perfectly healthy, and I did not anticipate trouble from it. When much dilated I should advise ligation, but in clean cases it is not always necessary to leave a ligature around the duct.

Another point is with reference to ureteral catheterization. Unfortunately, it is a rather dangerous procedure in the cases in which we need it most. It is valuable from a diagnostic point of view, and I make frequent use of it. But where we have an infected bladder I question the safety of catheterizing the ureters. If we have one kidney that is practically destroyed from a suppurative process and the other is healthy, it is better to rely on the subjective signs than to interfere and run the risk of infection of the healthy kidney by catheterizing the ureters. Certainly, if we have a large pyonephrosis and the patient is in a good physical condition, and no casts are found in the urine, it is far better to rely upon these signs than it is to insert a catheter into the ureter. Patients have died from catheterization of the ureters, and if it is practised indiscriminately they will continue to die, and for that reason I would like to utter a word of caution.

Drainage in cases of pyonephrosis is also a very important step which the doctor brought out. A great many of these patients are in a condition unable to withstand a prolonged operation or one attended with shock. Again, there is a certain amount of kidney tissue left which may recover and resume its functions. That we cannot tell without giving it a trial, but if it is completely destroyed, if the kidney is nothing but a large, thin sac, or a number of sacs, there is no use trying to preserve it. I prefer in such cases, where the patient is able to stand an operation, to do the whole thing at once, because scar tissue is more or less an obstacle, though not a serious one, in the secondary operation. Especially is the secondary operation difficult, as in the first one reported by Dr. Bovée, where nephrectomy had been done and a tuberculous ureter left. In such instances as that there is a great deal of difficulty in locating the ureter. It has been suggested that where nephrectomy is done and there is a suspicious condition of the ureter, we should bring up the ureter and catch it to the incision. But that is impracticable. Very frequently the ureter will not come high enough,

especially if we take off the upper end of it, and if we attach a ligature and bring it out we will be doomed to disappointment. My work has been confined largely to tuberculous kidneys and ureters and to suppurative processes of these organs. I have had nothing in the line of malignancy of the ureter. In each case of partial nephro-ureterectomy there was impaction of a calculus in the ureter, and of course the suppurative process extended rather low down.

As to the incision, I naturally prefer the transverse, turning slightly downward. I have found that it gives a great advantage in all kidney work. Even in anchoring a kidney, a short transverse incision will give an immense advantage over a vertical incision, and by approximating the structures layer to layer you will get union that will never give the patient trouble. In one instance I was particularly fortunate in making a transverse incision; the kidney was very large, and had been practically destroyed by the suppurative process. The hepatic flexure of the colon was bound tightly to the anterior surface and lower extremity, and was displaced to the opposite side of the median line. It was hard and brawny. In going down, after evacuating the pus, I ran my hand around the posterior surface, separated the adhesions, as I would do with an ovarian cyst, caught the renal artery, and cut off the blood-supply before enucleating the sac. That, indeed, was fortunate, because I found the dissection was necessarily tedious, and had to be very carefully done. It required a little care to separate the colon without running my finger through the hard, brawny tissue, which would easily have ruptured on bending or sharp flexion. After getting deep down, I found the ureter inclining toward the median line farther and farther inward, much to my surprise and discomfiture. I found quite a close adhesion with the vena cava, and a good deal of brawny tissue about them, such a condition that no one likes to encounter. I then desisted in the attempts to enucleate the ureter, but split it open on the side, peeled out the mucous membrane down to the calculus, removed it, and packed the upper extremity. In that case no ligature was used, there was no leakage, and the patient made an excellent recovery.

Dr. Charles P. Noble, of Philadelphia, Pa.—I was much interested in the thorough paper of Dr. Bovée. The question of nephrectomy is one of interest to all of us. I have done but two nephrectomies for malignant disease. One was for a papillary

cancer; one was for a very rare cancer of the kidneys, the so-called hypernephroma. It is a form of malignant disease which is brought about by the fœtal inclusion of certain cells which ought to go into the adrenal gland, and they subsequently became malignant. I have had two cases of nephrectomy for stone, and the rest were tubercular. All of the patients recovered, although one patient died six weeks afterward from tubercular or septic trouble in the chest.

The title of Dr. Bovée's paper was nephro-ureterectomy, which, of course, brings up prominently the necessity for ureterectomy in addition to nephrectomy. It has not been my impression that this necessity is frequent. I have been influenced that way partly by my own cases and partly by the microscopical study of two ureters which I know were removed and were supposed to be tubercular, and were proved to be non-tubercular. Of the eight cases of tubercular kidney that have come under my observation and upon which I have operated, in only one was any considerable portion of the ureter removed. In one case the ureter was very much thickened, and it was removed down below the brim of the pelvis. Because this patient was very feeble I did not remove the remaining pus, supposing, however, that I would subsequently have to remove it. Much to my surprise, it recovered itself, and the patient has had no trouble. That patient had a tuberculous bladder and got well without any treatment whatever. So that, with the experience of my own eight cases in which the ureters have behaved themselves perfectly well, and in two other cases which were supposed to be tubercular when removed and examined and proved not to be so, my impression is that it is unwise to remove the ureter at the time of the operation unless distinctly diseased and in a vigorous patient. Of course, that does not cover the cases in which there is a large amount of pus present in the ureter, or stones with pus pockets.

Another point which has impressed me very strongly is the question of the other kidney. It has so happened in every case I have operated on, that is, of tubercular and pus cases, that there were casts present in the urine from the supposedly sound kidney. In every one of those cases the urine from the good kidney contained casts. Subsequent to the operation the kidney recovered itself, and the patients are all in good condition now, with a good kidney. Where we have pus in one kidney we are

apt to have trouble with the other one, due to septic absorption, and the other kidney becomes involved. So I would not feel that because there were casts in the urine from the sound kidney it would be a contraindication to nephrectomy, if we had an abscess in the opposite kidney, providing the patient was passing a fair amount of urine, and examination showed the amount of urea present was up to normal. I think this is an interesting point, and I wish to emphasize it from my own experience.

From the stand-point of preliminary nephrotomy, I feel about the same as Dr. Noble, of Atlanta, does, that is, the conditions would have to be very marked to make me prefer a nephrotomy to a nephrectomy. In none of the cases I have operated on was the amount of kidney substance appreciable, and certainly from the stand-point of conservatism we would lose nothing by doing a nephrectomy. The only condition which would lead me to do a nephrotomy would be the undoubted presence of a large amount of kidney substance in a non-tubercular case.

The last point I wish to speak of is the question of catheterization of the ureters. Theoretically, catheterizing or sounding a ureter through an infected bladder might possibly cause trouble. Personally, I have had no difficulty in that direction. I have catheterized the ureters many times, and so far as I know there has been no infection on the sound side. I feel that it is very essential to have all the information we can obtain about the supposedly good side before we do the nephrectomy, because if one is satisfied the sound kidney is in good working order he has no hesitancy in proceeding with the operation, so that I feel very much more strongly on this point than Dr. Bovée appeared to in his paper.

Dr. R. S. Cathcart, of Charleston, S. C.—The paper of Dr. Bovée was interesting to me for the reason that I have had a similar case to the first one reported by him, which was a nephro-ureterectomy done for a tuberculous kidney. In my case at first I made a lumbar incision, intending to take out the kidney, but found the mass so large and the adhesions so dense that I could not manage it without severing a great deal of connective tissue; so I decided at the time to do simply a nephrotomy, drain the kidney, and nine weeks later selected the transperitoneal route, and did a complete nephro-ureterectomy. I ligated the ureter close down to the bladder. It has also been my good fortune to assist our President, Dr. Simons, in a case of

nephrectomy for malignant disease, which was done about two years ago. I prefer the transperitoneal route, because I think we can do our work much more quickly, and it gives us a greater facility to examine and palpate the other kidney.

Dr. Hugh H. Young, of Baltimore, Md.—I have been requested by the President to discuss briefly here the question of catheterization of the ureters in the male, which was to appear earlier on the programme. As most of you know, many instruments have been devised for this purpose. Unquestionably the instrument of Casper, with a double ureteral barrel, is the best that can be used, and with it it is generally an easy procedure to catheterize the ureters in the male. You see here (demonstrating instrument) there is a small tube for the catheter outside of the cystoscopic barrel, and that the optical part is the same as in the ordinary Nitze cystoscope. After finding the ureter you insert the catheter, and, as a rule, in the male it is an easy procedure. There are, I suppose, a good many cases in which the procedure is difficult in the female as well as the male, particularly cases in which the mouth of the ureter is distorted and the ureteral ridge is enlarged, and also where the orifice is strictured and everted. I have seen cases in which the ureter appeared as a sort of papilla, with the orifice at its end, and in such instances it is difficult to get the catheter engaged. However, taking the great majority of the cases into account, catheterization is easy to one skilled in cystoscopy, and with this instrument it can be done under local cocaine anæsthesia.

In regard to the danger of ureteral catheterization, which was brought up by Drs. Bovée and Noble, I may say that I had the privilege of working with Casper in Berlin, and that he does not hesitate to catheterize the ureters in most cases, whether the bladder or kidneys be infected or not, and says that he has never infected a healthy kidney. In cases in which I find a severe infection of the bladder present I endeavor first to reduce the infection by previous treatment, use copious antiseptic irrigations before the operations, and catheterize only one side unless double catheterization is necessary.

In tuberculous cases there is very little danger of infecting a sound side with that disease. Fortunately, in the majority of cases in which we are called to do the ureteral catheterization there is little or no infection present. Ureteral catheterization is often a

very great help in stone cases. Only two months ago I had an interesting case which, on cystoscopic examination, showed a bulging of the bladder on the left side. A ureteral catheter was inserted only about an inch, when it struck something, would not go any further, and doubled on itself. A skiagraph showed a calculus about the size of the end of the finger impacted at the lower end of the ureter against the bladder, and preventing the upward progress of the catheter. I removed the stone by an extraperitoneal route, and found the ureter very greatly distended.

I agree with Dr. Bovée concerning the propriety of not removing the kidney at once in suppurative cases. In one case that was sent to me last summer for ureteral catheterization a nephrotomy for pyonephrosis had been performed, but, although a considerable amount of pus was escaping from the wound, he was having nightly chills and fever. The septic temperature showed there was absorption from this kidney. On catheterizing the ureters I found the urine from the left contained pus, while that from the right contained no pus, but a large number of bacilli, which proved to be the colon bacillus. My interpretation was that these organisms were present in his blood, and that they were being eliminated by the right kidney, but had not as yet produced any suppuration on that side. In my report to his surgeon I stated that I thought it advisable not to attempt to take out the left kidney, because the patient was unquestionably septic, and the other kidney might have been damaged by the constant progress of the bacteria through it. I therefore urged at first a thorough drainage of the left side. This advice was not followed. A complete extirpation was resorted to, and the report of the autopsy stated, much to my satisfaction, that the right kidney was not involved at all—that it was simply slightly hyperæmic, although a large number of bacilli were found. Microscopically the kidney appeared to be perfectly normal.

This summer I had a case of pus kidney as large as one's head, due to the typhoid bacillus, the patient having had an attack of typhoid fever seven years previously. The bacilli were present in large number in pure culture. In that case drainage of the kidney and the use of urotropin apparently effected a cure.

Dr. Alexander Hugh Ferguson, of Chicago, Ill.—I cannot refrain from saying a few words on the surgery of the kidney, if you will bear with me for a few moments. I do not think there

is any dispute among surgeons as to the advisability of resorting to nephrotomy when there is pus in the kidney in preference to nephrectomy. The few remarks I wish to make to-day are with regard to the removal of the kidney and the entire ureter.

I have here a drawing of the remains of a kidney destroyed by pus and an exceedingly thickened ureter filled with stones down to the bladder. It is interesting from many stand-points. The man had been operated upon three times, the last one nine years ago, and stones were removed each time. A urinary fistula resulted. It is to be noticed that the kidney is almost entirely destroyed, the ureter enormously enlarged, having the diameter of over an inch in places, and filled with stones from one end to the other. A curious condition is the encystment of a stone having a fibrous occlusion above and below it, with no pus or germs surrounding it. On account of the quantity of fibrous thickening and adhesions the nephro-urectomy was somewhat difficult, but nevertheless successful.

I do not know how many kidneys I have removed, probably fifty in all, and I have dealt with the ureter in almost every imaginable way. I have two patients in the hospital now from whom I removed the kidney and ureter as a secondary operation to nephrotomy. When the ureter is healthy I buttonhole the groin, bring the ureter through it, and fasten it there. You can dissect the ureter with your hand without making an incision other than the one made to remove the kidney.

The groin fixation of the ureter is an excellent plan in male cases, and in the female I prefer it to taking it into the vagina (as recommended by Kelly). Should the stump develop tuberculosis a second operation can be more safely and easily performed than when it is otherwise dealt with.

Dr. Bovée (closing the discussion).—The pleasing feature to me in connection with this line of work is that I have succeeded in creating an interest in it, believing that a good deal of work is being done along this line. But very little attention is being given to the literature of the subject. The literature of the subject is not being built up as it should be, and that is largely my excuse for drumming away at it. I am very glad to have had such a good discussion and to know that a number of others are interested in this work.

There are a number of points mentioned in the discussion with which I am fully in accord. Dr. Noble, of Philadelphia, men-

tioned strain upon the opposite kidney, as demonstrated in one case by the presence of casts in the urine. On the other hand, Dr. Young spoke of organisms being thrown off from the opposite kidney, which was demonstrated later at autopsy to be a healthy one. In my cases there were plenty of casts found in the urine following operation, but not any before operation, and it was plain enough that those casts came from the healthy kidney.

Dr. Noble has stated that in a number of these cases the ureter is not sufficiently involved to require its removal. I agree with him in that regard, so far as our ideas of the surgery of these structures to-day are concerned, because there are numbers of cases in which there is a tubercular inflammation spreading down the mucosa into the bladder that later clear up. Willy Meyer makes a strong point of this, and also Henry Morris in his work of two volumes on *Surgical Diseases of the Kidney and Ureter*, that has just appeared. Many of these patients recover completely; but we cannot know that all these cases will recover completely, and a number of cases of partial ureterectomies have followed one another on the same patient because of such failure. The kidney has been removed, but the ureter has not; pus has continued to discharge, the ureter has been searched for, a portion of it removed, and the pus still continued to discharge, when the ureter was again searched for and removed. In Reynier's case three operations were done on the ureter before curing the patient. One of us would feel very much chagrined if he had done a nephrectomy with a diseased ureter and had left the ureter in, and then had to operate two or three times to remove it. I think we would feel a great deal better if we had removed the ureter at the primary operation. As our surgery and technique in this work improve from increased experience, the operation will not seem to be such a great bugbear as some consider it, and the removal of the ureter will be done more frequently than it has been, certainly not to the detriment, but to the advantage of the patient. It is a conservative measure.

As to the relative merits of nephrotomy before nephrectomy, I would say in those two cases of mine I did not dare to try nephrectomy on them because they were in such a feeble condition. Extreme stimulation was carried on during the nephrotomy, and probably I was not more than three minutes in doing the nephrotomy and emptying the pus. Stimulation was begun simultaneously with anæsthesia, by hot saline solution under the

skin and hypodermic injections of strychnine, and enemata of whiskey and carbonate of ammonia were given when the patients were put to bed. Nephrectomy is by far a larger operation than nephrotomy, one simply consisting in opening the abscess of the kidney, the other requiring ligation of the renal artery, enucleation, etc. The technique of the two operations is different altogether; more time is required in performing one than the other. The chief reason for doing a nephrotomy first is this: If you do a nephrotomy and let out the pus, you save the opposite kidney the extra taxation it is undergoing. You permit that kidney to assume practically a normal condition before you put the extra taxation on it of the severer operation.

THE OPERATIVE CURE OF PROCIDENTIA UTERI.

By Charles P. Noble, M.D.,
Philadelphia, Pa.

In order to avoid confusion, before discussing the operative treatment of procidentia uteri the definition of this condition and its etiology should be given. The older authors classify it as being of the first, second, or third degree. The first degree includes cases in which the uterus occupies a slightly lower position in the pelvis than normal. The second degree includes cases in which the cervix uteri approaches the introitus vulvæ. In these cases usually the uterus is retroverted. The third degree includes cases in which the cervix has escaped from the vulva and in which the vagina is more or less completely inverted. From the stand-point of etiology and from that of treatment, procidentia of the first degree is essentially different from procidentia of the second and third degrees. It is better to classify such cases as descensus uteri. In this paper all references to this class of cases will be omitted.

From the stand-point of etiology, all causes which lessen the supporting power of the pelvic floor, which increase the weight of the uterus, or which increase intra-abdominal pressure may produce procidentia uteri. Practically, in my experience, procidentia is almost invariably caused by laceration of the pelvic floor in labor. I have notes of but a single case in which it was caused purely by increase in intra-abdominal pressure, that of a single woman whose occupation caused her to carry heavy burdens daily for a number of years. By the increase of intra-abdominal pressure the uterus was eventually forced down until the

cervix projected beyond the vulva. Therefore, practically this cause has little to do with causing procidentia, although undoubtedly it aggravates cases produced by other causes. I have seen a few cases in which the uterus was forced down by the weight of tumors, usually fibroid. This factor is also of but little practical moment. Certainly, in more than 95 per cent. of cases procidentia is produced by laceration or overstretching of the pelvic floor in labor. These preliminary considerations are necessary to indicate that all cases of descensus uteri produced by tight-lacing and by relaxation of the normal supports of the uterus from poor health are ruled out as belonging to an entirely different class of cases. Cases of retroversion of the uterus with slight descensus, and cases of hypertrophic elongation of the cervix, whether supravaginal or infravaginal, are likewise excluded.

Prolapsus uteri should be regarded as a hernia of the pelvic contents, primarily induced by the partial or total loss of the supporting function of the sacral segment of the pelvic floor, and not as a mere displacement of the uterus. A realization of this fact, and also of the teaching of Schultze concerning the factors normally engaged in maintaining the uterus in its proper position, are necessary for an adequate conception of the problems which present themselves in the cure of procidentia uteri.

I have notes of 130 cases of procidentia uteri treated by operation. The results obtained in this series of cases and the experience gained in dealing with them are the basis of this paper. The results, on the whole, have been so satisfactory that I am decidedly optimistic concerning the prognosis of the operative cure of procidentia. Contrary to the opinion expressed by various writers, it is my experience that the same operations are applicable to the cure of almost every case, slight modifications in detail being necessary to meet special indications. In typical cases of average severity the method followed is to curette the uterus, to amputate the cervix, to resect the anterior vaginal wall, to restore the in-

tegrity of the pelvic floor (perineorrhaphy), and to suspend the uterus from the anterior abdominal wall (suspensio uteri). By this series of operations the following objects are accomplished: The weight of the uterus is lessened, further involution of the uterus is promoted, the redundant, overstretched anterior vaginal wall is resected, the supporting function of the sacral segment of the pelvic floor (perineum) is restored, and the prolapsed uterus is restored to approximately its normal position of anteflexion, so that the force of intra-abdominal pressure shall fall upon its posterior wall instead of upon the fundus or its anterior wall.

A few comments will indicate the estimation in which the various steps of the operation are held. *Curettage* is usually of but little importance. It is of distinct value in cases of hypertrophy of the uterus, especially when recent and when accompanied by hyperplasia of the endometrium.

Amputation of the cervix lessens the weight of the uterus, especially when the cervix is much hypertrophied from laceration or from hypertrophied elongation. It distinctly promotes involution of the uterus when this organ is much hypertrophied. Another important object accomplished by the amputation, especially in cases in which cystocele is a marked feature, is that the vagina is attached to the uterus at a higher level. When indicated, the vagina can be attached to the uterus half an inch or more above its normal point of union.

Resection of the anterior vaginal wall serves to remove the redundant or overstretched anterior vaginal wall. The degree of redundancy of the anterior vaginal wall is very variable, and depends upon the extent of the cystocele present in the individual case. Resection of the anterior vaginal wall is a great advance upon the older operation of anterior colporrhaphy, because it removes the excess of tissue and because the thick edges of the cut vagina unite firmly. The anterior vaginal wall left after this operation is much less apt to stretch out subsequently than is true of that obtained by the older operation, in which merely a certain part of the mucous

membrane was denuded, and the raw surface thus obtained was folded upon itself.

The restoration of the supporting function of the perineum or sacral segment of the pelvic floor is secured by means of a modified Emmet's perineorrhaphy. Special attention is devoted to rolling back the everted tissues of the rectocele and fastening the posterior vaginal wall to the levator ani muscles; and, what is of even more importance, to re-attaching the vagina to the levator ani muscles, to suturing the anterior borders of these muscles to each other in front of the rectum, and to building up a firm introitus vaginæ. By this means the pubic segment of the pelvic floor is well supported.

The final step, *suspensio uteri*, restores the uterus to its position of anteflexion and causes the ever-present force of intra-abdominal pressure to act as a conservative force instead of having it tend to reproduce the procidentia, as would be true were the uterus left retroverted.

In cases of less than average severity a less extensive series of operations may be sufficient. In those cases in which the pubic segment of the pelvic floor is prolapsed, owing to the destruction of the perineum, and in which the uterus remains anteflexed, it may be unnecessary to do more than resect the anterior vaginal wall and to restore the perineum. Such cases are not common.

In young women of childbearing age in which the procidentia is not extreme, and in which the lateral and posterior attachments of the vagina have been but slightly loosened, after performing the series of plastic operations as indicated, shortening of the round ligaments may be substituted for hysterorrhaphy. In such cases this combination of operations has yielded excellent results. In cases of moderate degree in women of childbearing age the substitution of Alexander's operation for hysterorrhaphy is to be recommended.

In resecting the anterior vaginal wall the tissue should be removed down to the bladder or to the loose connective

tissue immediately under it. The tendency in performing this operation is to remove too much rather than too little tissue, so that the operator should carefully guard against this mistake. If too much tissue is removed laterally the result is to lower the level of the anterior vaginal wall, and necessarily also the level of the floor of the bladder; and, what is of equal if not greater importance, so much of the lateral walls of the vagina are dragged forward toward the median line that a sufficient amount of the vaginal wall is not left to construct a satisfactory perineum. The form of that part of the anterior vaginal wall to be resected must depend upon the degree of redundancy in the particular case. The two cardinal points to be borne in mind are that too much tissue must not be removed, and that as a result of the operation the anterior vaginal wall must not be foreshortened. Stoltz's operation, which foreshortens the anterior vaginal wall, drags the cervix forward, and thus favors the occurrence of retroversion of the uterus and the reproduction of the procidentia.

The perineal operation must be fitted to the individual case. When the laceration or overstretching of the pelvic floor is extreme, with marked separation of the levator muscles from each other or from the vagina and rectum; when rectocele is a prominent feature, or when more or less complete inversion of the vagina is present, with a detachment of the lateral as well as the posterior walls of the vagina, it is necessary to extend the lateral denudations much further up the two sulci than is true in cases in which the injury to the pelvic floor is of lesser degree. The extension of the denudations well up the sulci permits the re-attachment of the everted posterior and lateral vaginal walls to the pelvic fascia and levator muscles. Care devoted to this step in the operation greatly improves the results secured. Fixation of the uterus should be substituted for the suspension of that organ in women who have passed the childbearing age. This is especially true in cases of complete procidentia in which there is marked relaxation of the uterosacral

ligaments and detachments of the vagina from the lateral walls of the pelvis and from the rectum.

The above series of operations entirely meets the indications anatomically and philosophically, with two exceptions. In cases of more or less complete inversion of the vagina, with detachment of its walls, no provision is made for the re-attachment of the lateral and posterior walls of the vagina in the upper third of this organ. Likewise no provision is made for the shortening of the uterosacral ligaments. It is in these two directions that improvement in the technique is possible. Fortunately, the percentage of cases in which this defect will interfere with securing a satisfactory result is very small. A discussion of the present methods in use for shortening the uterosacral ligaments will be omitted, because my personal experience in this direction has been very limited. The method which has been employed for some years in amputating the cervix is an eclectic one, which I shall describe in detail elsewhere. Special attention is devoted to securing a patulous external os.

In resecting the anterior vaginal wall a strip of vaginal wall is removed with scissors from a point in front of the cervix to one about half an inch behind the meatus urinarius. This strip is removed down to the vesical wall or to the loose connective tissue immediately beneath it. Each border of this opening is seized with forceps, and the bladder is pushed away from the vagina with the finger, then the vaginal wall is resected. In closing the wound a special form of catgut suture, which I have called the "half-hitch continuous suture," is used. This enables one to rapidly close the wound in two layers without foreshortening it. The catgut sutures are reinforced with one or more mattress sutures of silkworm-gut.

The perineal operation has been described in "A Contribution to the Technique of Operations for the Cure of Laceration of the Pelvic Floor in Women," *American Gynecological and Obstetrical Journal*, April, 1897.

In performing suspensio uteri Kelly's technique is fol-

lowed. When the question of childbearing can be ruled out the uterus is more firmly fixed to the abdominal wall. In the more extreme cases the temptation is strong to narrow the vagina unduly. This should be avoided, especially in elderly married women. After the menopause the vaginal walls are so inelastic that if unduly narrowed marital relations are impossible. A number of such cases have come under my observation. This unfortunate result is best avoided by making only a moderate resection of the anterior vaginal wall. When this is done a firm perineum and vaginal outlet can be built up without unduly narrowing the calibre of the vagina.

The use of chromicized catgut sutures for the amputation of the cervix and of cumol catgut sutures for the resection of the anterior vaginal wall is especially desirable. One or more tension sutures of silkworm-gut should be introduced in the anterior vaginal wall. By using absorbable instead of non-absorbable suture material the removal of these sutures is avoided. Not only does the patient escape a painful experience, but without doubt not a few perineums will escape injury which may well be inflicted by traction upon the recently united perineum in the attempt to remove sutures from the cervix.

Total hysterectomy has been performed in three cases—twice by the vaginal and once by the abdominal route. I believe that hysterectomy has a very limited field of usefulness in the treatment of procidentia. To remove the uterus alone is useless, as the patient will still have a hernia of the pelvic contents, practically the only difference being that a scar will be present in the centre of the projecting mass instead of the uterus which has been removed. When the procident uterus is cancerous (I have never seen such a case), when it contains fibroid tumors, or when it is enormously hypertrophied, hysterectomy is or may be indicated. When performed, the broad ligaments should be pulled through the vaginal opening, and the vaginal walls should be stitched to the upper borders of the broad ligaments and round liga-

ments, so that these structures may serve as guy ropes to hold up the vagina. Immediately following this operation the usual plastic operations upon the posterior and anterior vaginal walls should be performed. Occasionally it may be desirable to substitute a supravaginal hysterectomy for a total hysterectomy, and to stitch the stump of the cervix to the abdominal wall. This operation will scarcely be indicated except in extreme cases of complete procidentia with inversion of the vagina and with extreme elongation of the supravaginal cervix.

The following table represents my experience in the operative treatment of procidentia uteri:

Plastic operation only	42
Plastic operation and hysterorrhaphy	67
Plastic operation and shortening the round ligaments	10
Plastic operation and supravaginal hysterectomy, with fixation of the cervix to the anterior abdominal wall	1
Plastic operation and vaginal fixation of the uterus	2
Plastic operation and vaginal hysterectomy	1
Vaginal hysterectomy	1
Abdominal panhysterectomy	1

In five cases other measures were adopted. The results, so far as known, have been that in two of the cases in which plastic operations only were performed a recurrence of the procidentia took place. Both these patients were successfully operated upon a second time with plastic operations and hysterorrhaphy. In one case in which a combination of plastic operation and hysterorrhaphy was employed the procidentia recurred. This was operated upon a second time by repeating the plastic operation, performing supravaginal hysterectomy, and fixing the stump of the cervix to the anterior abdominal wall. The result was entirely satisfactory. No other relapses are known.

DISCUSSION.

Dr. J. Wesley Bovée, of Washington, D. C.—I want to mention in this connection some work my colleague (Dr. Stone) has been doing. His method consists of cutting through the

vaginal wall to the bladder, separating the bladder from its attachments laterally and to the uterus, taking hold of the bladder low down, suturing it to the uterus high up; all this being done extraperitoneally. Then he inserts his sutures in such a way as to pull the fascia toward the median line in front of the cervix, building up the anterior vaginal wall, in that way forming a buttress in front of the cervix which serves as a support for the uterus, preventing the beginning of descensus of the uterus. I believe that most cases of descensus of the uterus are due to a deficiency in the uterosacral ligaments or in the anterior vaginal wall, and I have largely directed my attention in the surgical treatment of this condition to those principal structures. If I had to open the abdomen to overcome such a condidition as extreme prolapse of the uterus I should shorten the uterosacral ligaments. This I do in many cases of retroversion or a mild degree of prolapse through the vagina, in such cases being very careful not to open the peritoneum. If these cases follow childbirth, as most of them do, and there is considerable relaxation of the uterosacral ligaments, the tear, usually high up, can be best reached through the abdomen, requiring the opening of the posterior layer of the peritoneum, bringing up the fascia, and shortening the uterosacral ligaments in that way. However, I should resort as far as possible to plastic rather than intraperitoneal work for remedying the condition. A firm perineum, with solid posterior and anterior vaginal walls, as Dr. Noble says, having the anterior vaginal wall sufficiently long, not shortened, is a very important matter in this line of work, and when I do that I would be very careful in such cases to draw the cervix pretty well back to the sacrum and a little higher, which is equivalent to shortening the uterosacral ligaments, caught up by suturing the fascia outside of the uterosacral ligaments, so as to prevent dropping forward of the cervix.

Dr. Robert T. Morris, of New York City.—It seems to me it is not often advisable to remove the uterus in these cases, and that in making a handle out of the uterus it is well to take off a big flap of peritoneum from the anterior surface low down, in order to get firm adhesion with the anterior abdominal wall, thus holding the bladder and rectum well up.

In regard to cancer in cases of procidentia uteri, I have had patients sent to me with the statement that "This patient has cancer of the uterus. What shall we do?" On investigation

I find it is not cancer at all. We have a sharp-edged ulceration to deal with that is due to engorgement with serous infiltrates. On account of the engorgement of the tissues and the serous infiltrates we have necrosis and a sharp-edged ulcer that looks like epithelioma, but without new islands of epithelium. A number of such cases reported as cancer are undoubtedly instances of simple ulcer, and require but little attention. (Here Dr. Morris went to the blackboard and demonstrated his method of operating on cases of procidentia uteri.)

Dr. Alexander Hugh Ferguson, of Chicago, Ill.—The paper read by Dr. Noble is an exceedingly interesting and practical one. I have been delighted with it. Those of us who do this class of work vary a little in our methods and technique. The principles involved have been clearly defined. There is a limited field for hysterectomy in this class of cases. I recall having had two cases in one day. One woman, sixty-five years of age, had complete procidentia. The hysterectomy was comparatively easy; and then I removed a broad strip from the posterior vaginal wall, suturing with continuous suture as I was stripping it off, and completing the work with a perineorrhaphy. The vagina was left not large enough to admit my little finger; was about six inches long or more. I could just insert one of these long forceps into it. I used catgut as a continuous suture material, one bite taking in the structures deeply, the other the mucous membrane. How shall we deal with those cases of procidentia uteri in women in the child-bearing period? I think the plastic work that has been described is excellent for those cases, but it is not enough. The method by which I suspend the uterus in these cases is by the anterior transplantation of the round ligaments, a method which was described by me at the Denver meeting of the American Medical Association. The only gynecologist of note I know of who has adopted this method is Dr. J. Clarence Webster, of Chicago. He uses this method and one of his own of attacking the round ligaments posterior to the uterus.

Dr. James T. Jelks, of Hot Springs, Ark.—The paper of Dr. Noble has indeed been a very interesting contribution, and I want to congratulate him on the clearness with which he presented the subject to the Association. Personally I do not see how any better technique could be employed, and I rise to say that I have witnessed the operation that has been described and demonstrated here by Dr. Ferguson. I was astonished at the

ease with which he performed the operation he has spoken of. In doing the operation he sat between the woman's legs, pulled the uterus out, took a narrow-bladed knife and plunged it down into the peritoneal cavity, and did so with ease and freedom, without any possibility of injuring the structures. I said to him that I would not dare do that, but he does it with perfect impunity. In a few minutes the operation is done. Personally I prefer the method Dr. Noble has advocated to the one practised by Dr. Ferguson, although in Dr. Ferguson's hands I do not know of any better procedure.

Dr. Noble (closing the discussion).—Some of the points brought out by Dr. Bovée were emphasized in the paper. Philosophically speaking, the operations which were recommended failed in two particulars; one of these Dr. Bovée emphasized—namely, it does not shorten the uterosacral ligaments. I am sorry to say that I do not think we have any satisfactory method of doing that. I have tried it in a number of cases, and I was not at all pleased with the situation, because when I got the uterosacral ligaments shortened there did not seem to be enough room for the woman to have her bowels move. Dr. Polk, of New York, tried to shorten the uterosacral ligaments, and had partial obstruction of the bowels, consequently he abandoned the method. Another difficulty I found when I had shortened the uterosacral ligaments in two cases was that the fundus would not reach the anterior abdominal wall. I could not make it work well, and I think there is room for improvement in that direction.

With reference to descensus of the uterus, I did not take up this subject in the paper, and so I shall not speak of that.

The remarks of Dr. Morris, in which he recommends the fixation of the uterus in front of the fundus, brings up the whole question of how to suspend the uterus. I do not think the method he has described is the best way to do it. It has disadvantages. In the first place, if we wish to suspend the uterus to attach it lightly, it is done at a mechanical disadvantage. If we sew the anterior wall of the fundus to the anterior abdominal wall the uterus is not anteflexed, therefore, the intra-abdominal pressure, which acts constantly throughout the subsequent history of the woman, tends to drive the uterus down, because it falls on the fundus or the anterior surface of the fundus, whereas if the posterior surface of the fundus is stitched to the abdominal

wall well the uterus is anteflexed and the intra-abdominal pressure becomes a conservative force. Therefore, I do not believe the method advocated by Dr. Morris is so good as that of Dr. Kelly.

The point raised by Dr. Morris regarding cancer I agree with. We have all seen ulcerated areas in cases of procidentia uteri that were due to traumatism. When a woman's uterus is so prolapsed that it is practically between her legs, she injures it all the time and it breaks down. The perineal operation recommended by Dr. Morris is similar or practically the same as the Tait operation. Personally, I do not think that those operations meet the indications. I stated in my paper that the second object which we failed to accomplish by the method advocated was that we failed to reattach the upper third of the vagina to its lateral attachments and to the rectum in the extreme cases of inversion. This operation recommended by Dr. Morris not only fails to reattach the vagina in the upper third, but it seems to me it fails to reattach it throughout its entire length, therefore, it would be three times as ineffective as the one recommended in the paper. That is true of all operations which, while they may give a good so-called perineal body within half an inch of the skin, fail entirely to re-attach the loosened vagina to its lateral and posterior attachments, so that I think, anatomically and mechanically, it is impossible with that class of operations to accomplish as much as should be accomplished.

The operation recommended by Dr. Ferguson is certainly ingenious. It reminds me of the first operation which was ever proposed for suspending the uterus, by Marion Sims. As I have said, the operation is ingenious, and ought to be judged by its results. I have not done it, and I can only admire its ingenuity.

REMOVAL OF FIBROID TUMORS THROUGH THE VAGINA BY CONTINUED SPIRAL INCISION.

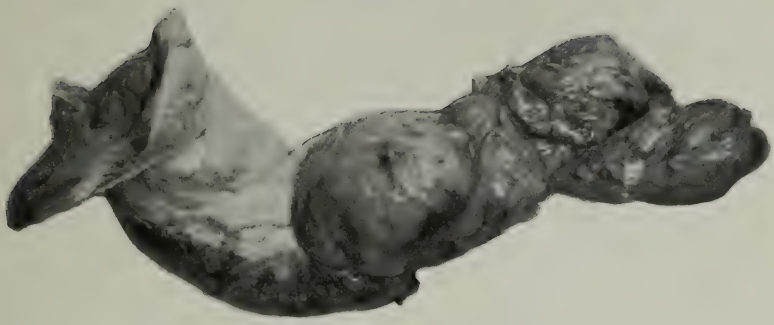
By George H. Noble, M.D.,
Atlanta, Ga.

It occurred to me that the removal through the vagina of large fibroid tumors in the lower portion of the uterus might be facilitated by a slight modification of the incision of the tumor instead of losing time in catching and recatching parts as they are cut away in the process of morcellation. I endeavored to devise a plan by which once fastening a hook in the tumor it might serve the purpose of traction for the entire operation without removal during its progress. The hook, therefore, is inserted into the lower portion of the tumor after splitting and separating the capsule, and the incision made in the spiral direction, cutting from right to left like a right-hand screw, thus making a thick rope of fibrous tissue two inches in diameter, which, when removed, has a characteristic cork-screw appearance.

Fig. 1 shows the mass or tumor in this shape as drawn out of the vagina. Fig. 2 represents the mass or tumor twisted into its original shape, but showing the spiral line of incision. The tumor was five inches in diameter at its greatest width and six inches in length, completely filling the bony pelvis. A portion of it extended into the vagina and caused superficial pressure necrosis of the vaginal mucosa.

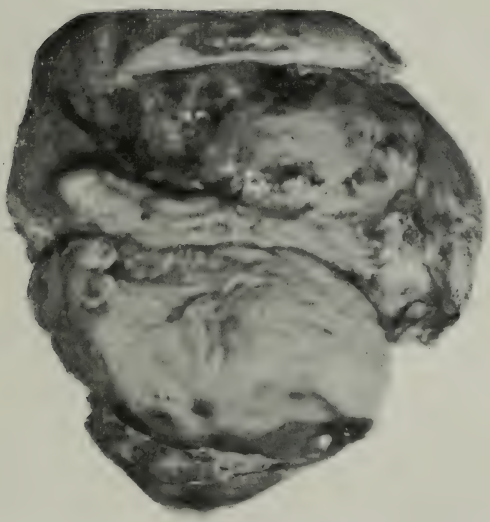
The operation was done under nitrous oxide and oxygen gas and the tumor was removed in six minutes, after which two large vessels were ligated, all within twenty minutes of anæsthesia, showing a great saving in time in the operation and facilitating the execution of the same.

FIG. 1.



Characteristic corkscrew appearance of tumor.

FIG. 2.



Tumor twisted into its original shape, showing spiral incision.

It is important not to cut small strips or make the turns in the spiral line too close together, as there must be body enough in the parts removed to prevent breaking or tearing away. A rope of tissue two inches in diameter will be strong enough to stand considerable strain in solid or single-lobed tumors. The traction forceps should be held by an assistant. The index-finger of the left hand is used to guide the point of the scissors and to separate the capsule from the tumor as the cutting proceeds, using hawk-bill scissors, as those with ordinary straight edges will retard the progress of the operation.

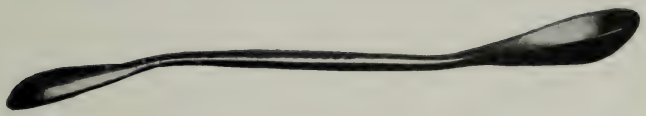
This method is suited only for large growths, as small ones can be turned out *en masse*, and is not recommended to take the place of all cases of morcellation, but will be found useful in isolated instances.

PUNCTURE SCISSORS AND COUNTER-PRESSURE INSTRUMENT.

By George H. Noble, M.D.,
Atlanta, Ga.

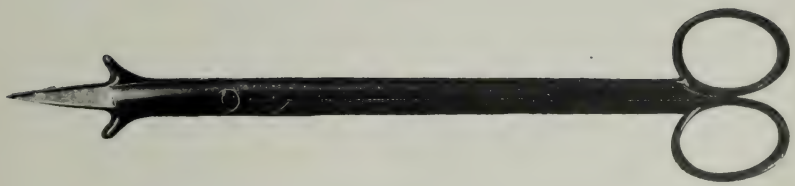
These instruments were designed for the purpose of facilitating vaginal puncture whenever it is necessary to drain through Douglas' pouch into the vagina after doing an abdominal section, and to facilitate incision of the vagina in panhysterectomy and not for puncturing abscesses from below. In puncturing from the abdominal side a pair of forceps or other instrument is necessary to make counter-pressure in the vagina; otherwise considerable time may be lost in penetrating it. For this purpose I have constructed an instrument shaped like a large dull curette or spoon. (Fig. 1.) It should be passed by an assistant up behind the cervix uteri with firm pressure, in order to stretch the fornix of the vagina tightly over the concavity of the spoon. The floor of Douglas' pouch being made tense and pressed firmly upward is much more accessible and easily punctured. The point of the scissors penetrates the thin, tight septum without much resistance, and is prevented from injuring the posterior vaginal wall and rectum by the counter-pressure spoon in the vagina. After the opening is sufficiently dilated the counter-pressure instrument will facilitate the introduction of the drainage-gauze from above by holding the parts steady and stretching open the upper extremity of the vagina. The puncture scissors are passed down through the abdominal cavity behind the uterus in the usual way, finding ample space on the tightly-drawn floor of Douglas' pouch to enable quick and easy puncture. The scissors (Fig. 2) are the long, sharp-pointed instru-

Fig. 1.



Counter-pressure instrument.

Fig. 2.



Puncture scissors.

ment commonly employed for this purpose, except on the outer edge or back of each blade, about an inch from the point, where a shoulder or guard projects outward at an angle of forty-five degrees. They are rounded, blunt, three-eighths of an inch in length, and serve the purpose of catching the tissues on the instrument and preventing them from slipping back in the direction of the lock, as so often happens when separating the blades of the scissors when dilating the opening. The cutting surface is limited to one inch, to prevent injuring any viscera that might accidentally slip in between the blades while spreading them apart.

They are not essential to the performance of hysterectomy and vaginal drainage, but add convenience in a small way, and will be found to accelerate parts of the work mentioned.

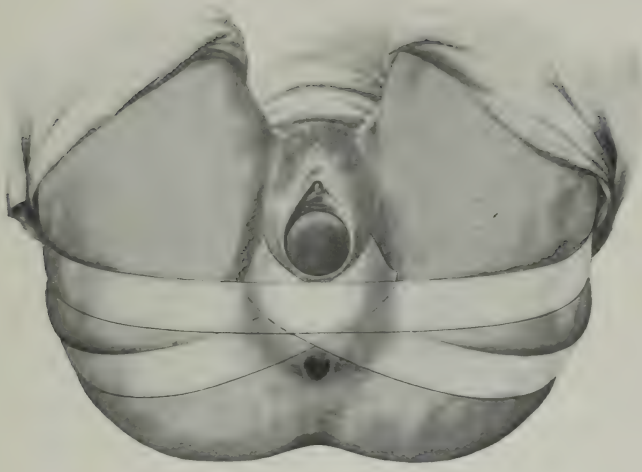
USE OF ADHESIVE STRAPS FOR THE PREVENTION OF LACERATION OF THE PERINEUM IN FORCEPS DELIVERY.

By George H. Noble, M.D.,
Atlanta, Ga.

The frequency of laceration of the female perineum is an evident fact that the methods now employed are inefficient. It occurred to me that mechanical appliances designed to take the strain off the floor of the pelvis and direct the shortest diameter of the presenting parts in the true axis of the outlet might lessen its occurrence, especially in forceps delivery. To accomplish this I made use of adhesive straps. They should be applied after the occiput has passed under the pubic arch and before the period of crowning is reached—that is, *before the pelvic floor is very much distended.*

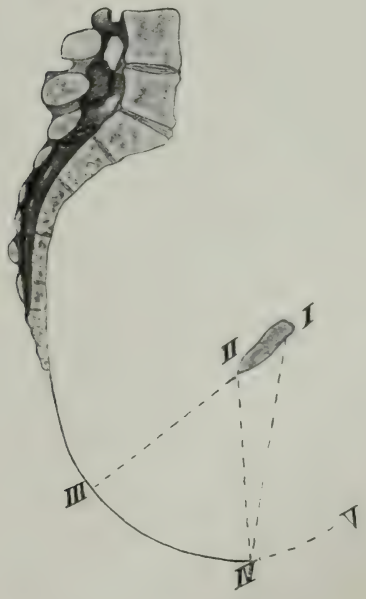
After thoroughly cleansing the parts with soap and water and such antiseptic solutions as may be desirable, the perineum and buttock should be sponged with alcohol to remove the moisture. The application should begin with straps (Fig. 1) one and one-half inches wide and eighteen to twenty-four inches long, attaching one extremity well upon the side of the labium and deep into the sulcus between it and the thigh, then passing downward and across the median line, just behind the posterior commissure; it is continued on the opposite side around behind the buttock and attached to the hips at or about the sacro-iliac synchondrosis. The second strap is passed in a similar manner on the other side, each one to be applied with as much tension as possible, drawing the labium well downward and the buttock upward. The third strap passes horizontally across the perineum at a level with the posterior commissure,

FIG. 1.



Method of applying straps.

FIG. 2.



and is fastened on either side of the flex thighs and hips. As the delivery proceeds the perineum will extend by stretching the skin beyond the edge of the straps, but chiefly by rolling the posterior vaginal wall out in advance of the head. When it has extended as much as one-half or three-fourths of an inch beyond the straps, or appears to be drawn tightly across the presenting parts, another horizontal strip of adhesive plaster is applied, which, as a rule, will be sufficient to complete the labor.

The straps take the strain off the perineum and change the direction of the presenting parts more or less forward to the normal or axis of the outlet by forcing it firmly against the lower anterior surface of the pubic bone, permitting delivery through a smaller orifice than can be effected when the head is delivered in the abnormal or axis of the bony outlet.

In illustrating (Fig. 2) let the lines III, II, and IV, II represent the diameter of the presenting parts; they are, therefore, equal. Then as the line II, I is common the lines III, II, I and IV, II, I are equal. Now as the lines IV, II, I represent two sides of the triangle I, II, IV, they are longer than the third side IV, I. Then as the line IV, I is shorter than IV, II, I and IV, II, I is equal to III, II, I the line IV, I is less than the line III, I. Therefore, when the presenting parts reach the position of IV, I less dilatation of the vulva outlet will be required than when it is at III, II, I, or at intermediate points between III and IV, or where laceration usually occurs. This could be better illustrated if it were possible to produce an exaggerated extension of the perineum in the direction of V. In that case the diameter of the presenting parts would be V, I, or the measurement from the anterior to the posterior commissure, which would be a gain of two-thirds of line II, I, or two-thirds of the depth of the symphysis pubis. In such circumstances that part of the vulva which is attached to the anterior surface of the pubic bone would take part in forming the circumference of the outlet or crowning.

As this exaggerated extension of the perineum is not possible the entire vulva outlet cannot be engaged, but in proportion to

its extension beyond the point III in the direction of IV there will be a gain toward engaging the entire vulva outlet. Upon the other hand, if the crowning occurs on the line III, I an excessive or unnecessary distention of the vulva outlet will be required; for that reason it is important to force the occiput or presenting parts firmly against the anterior portion of the pubic bone as soon as it has passed under the arch. This is accomplished in a large measure by the adhesive straps when applied in the manner here described It is true they lessen the elasticity of the parts or produce a slight sense of rigidity; but when the forceps are used in the axis of the outlet, and especially with the axis traction rod, it does not interfere with delivery. These straps are recommended for the protection of the perineum, and not for the prevention of tear in the vagina above the perineum, such as are produced by disproportioned and ill-constructed forceps or unskilled management of the latter.

Up to the present I have applied these straps in six forceps deliveries with perfect satisfaction, using them in cases in which the perineum appeared to be in imminent danger.

DISCUSSION.

Dr. James T. Jelks, of Hot Springs, Ark.—These strips of adhesive plaster for the purpose of preventing laceration of the perineum, as described by the essayist, are ingenious, but I think they will fail to meet the indications as I can see them. In lacerations of the perineum we do not have simply skin lacerations to contend with, but the torn pelvic fascia and a separation of the muscles that constitute the pelvic floor; hence, it seems to me, these adhesive strips, while they support the skin, fail to reach the parts underneath the skin, whence all the trouble comes. We have the pelvic fascia attached, the vagina holding it up, and as the head of the child comes down here (indicating) the pelvic fascia, composed of white fibrous tissue, is totally inelastic. I do not see how it is possible for these strips on the surface of buttocks and vulva to support the perineum to any great extent when the child's head passes through the outlet. We know that the skin stretches to almost any extent desired, and where we

have the attachment of the pelvic fascia to the vagina and vaginal outlet I do not see any means to keep it from tearing. It is here that the trouble comes. It is not simply the skin which tears, but a separation of the pelvic fascia and muscles from the skin and vagina that makes the relaxed vaginal floor. While the method is ingenious, it seems to me to fail to meet the indications.

Dr. Virgil O. Hardon, of Atlanta, Ga.—I think this method of Dr. Noble is based upon a correct principle, and that principle consists in the fact that it conduces to the carrying out of the normal mechanism of labor, in that it supports the perineum and enables it to resist the pressure brought upon it. It facilitates the mechanism of labor at this stage, and enables the head of the child to pass through the vulva with its smallest diameters in relation to the vulvar opening. I believe failure in preserving flexion of the head long enough to allow the occiput to pass completely out under the pubic arch is the cause of a large proportion of the lacerations of the perineum that takes place. If the head passes through the vulvar opening while the occiput is in contact with the pubic arch, then we have the occipitofrontal or occipitomental diameter passing through the vulvar opening; but if flexion of the head is maintained, as it will be maintained by pressure with these adhesive strips or any other pressure until the occiput has passed completely out under the pubic arch, so that the pubic arch embraces the back of the child's neck, then we may feel that the perineum is safe. I believe that therein lies the mechanism of this procedure. The principle can be carried out successfully by making pressure on the perineum, and thereby maintaining flexion of the head up to the time when extension may safely take place. I believe the principle can be carried out by the use of these adhesive strips as well as, but no better than, by any other kind of pressure.

Dr. Thaddeus A. Reamy, of Cincinnati, Ohio.—I did not expect to be called on to discuss this subject. However, it is a question of great interest, but I do not think I can throw any great light upon it. In my earlier experience I did a good deal of obstetric work. I am satisfied that maintaining flexion of the head until the proper time is important. There is considerable danger, especially with the inexperienced practitioner, in making pressure upon the head of the child in order to maintain this flexion for a longer time to secure the objects indicated

by the last speaker, and great damage may be done. I am satisfied that many practitioners compress the fœtal head to a dangerous degree. They forget that many cases of mental trouble in children and nervous affections involving the extremities are due to injury to the head of the child in that moment of excitement, the obstetrician thinking that the chief aim of his services is that the child be delivered alive for the time, and that the woman's parts shall be maintained as far as possible. But as to the maternal structures: The most common injury in these cases is overlooked at the time of delivery, but is observed by the gynecological surgeon subsequently when they come under his observation and care, not wholly for extensive laceration of the perineum, but for prolapse of the posterior vaginal wall, rectocele, etc. Everyone doubtless knows that the most uniform deformity is a separation of the vagina from the integumentary portion, not a laceration of the external portion of the perineum, but a separation. Attention has been called to this in a masterly way by Emmet. He particularly emphasizes separation of the vagina from its deep fascia.

With reference to supporting the perineum during delivery by means of adhesive strips, as advocated and suggested by the essayist, I cannot go back upon the principle of external support of the perineum in such cases, since in the *Transactions of the American Gynecological Society* will be found a paper by myself, not many years ago, in which I proposed and advocated support for the whole perineal structures by means of a towel properly applied and properly held by two assistants. I did not hear Dr. Noble's paper on this subject, but I have no doubt the use of the adhesive strips which he recommends involves the identical principle. It is a distribution of the force of pressure and a general support to the perineum and the avoidance of undue violence at any one point. It is a question of physics, and would be susceptible of interesting discussion if time permitted for it. I tested thoroughly support to the perineum during delivery in a large number of cases before I discontinued obstetric practice, and I assure you the principle is sound, and that it can be successfully carried out. This general support over a broader field being supplementary to that support which the natural structures themselves are able to give, would prevent this separation of the vagina from the external structures, to which I have already alluded, which is the more common injury—one that is fre-

quently overlooked in the immediate repair of the perineum, and which needs a subsequent operation a year or two afterward. If the adhesive strips that are applied cover a broad enough surface to include the whole field and render the support necessary, I have no doubt they are advantageous. But there is a possible objection that they will not hold.

Dr. D. F. Talley, of Birmingham, Ala.—In connection with the paper of Dr. Noble I wish to state that I had a case last Sunday in which I used adhesive strips, the thought having been suggested to me by looking at the programme and seeing the title of Dr. Noble's paper. This woman was small, a primipara, and I had an occipito-posterior position to deal with. She had been in labor about thirty-six hours when I delivered her with forceps. The head of the child came down almost to the perineum, and could not be delivered without forceps; so I applied forceps, and when I was pulling under the symphysis the parts bulged even more than the doctor's picture represents, and it looked to me as though everything was going to be torn out, and that I would have a complete laceration of the perineum down into the bowel. As soon as I saw that condition the thought flashed on my mind to use adhesive strips. I had my assistant put this strip across (indicating), which filled up the space between the lower commissure and anus. However, I thought at the time that some other support was needed around, because the parts were bulging so much, and that there was a small space at this point (indicating), which was not embraced by the strip. My assistant put on the strip and held it there, so that it would not slip, and I delivered the child. I did not notice that there was any great amount of resistance due to the application of this strip. The delivery was not particularly difficult.

To come to the important point, in a case of that kind, with an occipito-posterior position in a young woman, small in stature, with a small vaginæ, we would expect in delivering her with forceps to get a complete tear of the perineum. My experience has been that where we have to deliver these primiparæ, with small vagina, even with an occipito-anterior position, the lacerations of the external parts were not only extensive, but also the vaginal mucous membrane. I remember a case I delivered before this, of occipito-anterior position, and the laceration of the perineum extended down to the sphincter muscle. I had two lateral lacerations of the mucous membrane of the vagina, which

extended almost to the uterus. One of them extended up to the cervix. In this case the laceration did not come half-way down to the bowel—that is the case in which I used the adhesive strips. There was only one laceration of the vaginal mucous membrane, and it did not extend up more than three-quarters of an inch; so I felt that I had been very much helped by this adhesive strip. I can readily see that Dr. Noble's method of application of the strip is better than the one I adopted or crudely applied. His strips give much more uniform support. I believe this adhesive plaster strip gives better support than one can possibly get with the hand. One cannot apply his hand around the perineum as uniformly as he can these strips, and I do not think he can maintain pressure with his hand as well as the strips will do it. This is a point which needs discussion. There ought to be some method devised by which women can be delivered without tearing them all to pieces. Many of these women suffer the remainder of their lives after such tears, because some of them will not submit to operations for their repair; and, of course, they are always better if their perineums are not torn than they are if they are torn badly. I have been very much impressed with this method of supporting the perineum during delivery. I feel quite sure that in the case I delivered Sunday night I would have had almost a complete tear into the rectum, and probably a more extensive tear of the vaginal mucous membrane, had I not used the strips. From the description given I do not see how we can prevent tears further up, but Dr. Noble may explain this to us in his closing remarks However, as I have previously remarked, I am sure the external tear in my case was very much slighter than it would have been without this support.

Dr. Southgate Leigh, of Norfolk, Va.—This is an ingenious method of supporting the perineum, yet I cannot see the necessity of it. If we put the patient on the left side in the last stage of labor—that is, when the head reaches the perineum—whether we use forceps or not, we can thoroughly protect the perineum unless it is bound to tear. If we find a tear is imminent, we can make a slight lateral incision. If forceps have to be used at this stage, and the short, low, old-fashioned forceps are applied, it will not cause any increase in the danger of tearing above that of the normal forceps. I have never seen a case that was not thoroughly protected, so far as the perineum is concerned,

if the patient was put on the left side. The principal point I want to mention is this: If the head is high up and forceps are applied in that position, I do not see how traction can be made in the right direction if the handles of the forceps are held forward by this strip.

Dr. Noble (closing the discussion).—I am glad to notice that some of the gentlemen who have taken part in the discussion have appreciated the principles I tried to illustrate. I may not have been as clear as I should have been. So far as laceration of the fascia is concerned, a point referred to by Dr. Jelks, I will state that the principle of supporting the perineum with these adhesive strips, retarding labor, preventing precipitate delivery, and necessarily forcing the narrowest diameter in the axis of the outlet of the soft parts, is the best means that can be employed for the prevention of laceration of the fascia. Ordinarily, laceration of the fascia is produced when the expulsive force is directed downward. In the process of natural labor I have often felt the fascia as a sharp border stretched around the head. You can get your finger over it and feel it distinctly, and I have noticed that by relieving pressure in that direction the fascia would gradually slip back behind the head. So the support given by these strips, retarding labor, preventing precipitate delivery, is the best means, in my judgment, at our command in preventing that laceration. I do not claim that these strips will prevent all lacerations, because there are women who cannot be delivered without more or less tearing. I have seen so many kinds of tears that I cannot conceive of any method that will act as an absolute preventive in all cases; but if this method contributes in the least to the prevention of these lacerations it is our duty to employ it. I am quite sure if Dr. Jelks will try this method, using the axis-traction forceps, which obviates the objection made by Dr. Leigh, he will find no difficulty. The strips do not extend beyond the posterior commissure; the axis-traction forceps do not pass beyond that point, and, if your instrument is constructed properly, it will not press on the posterior commissure, but it will give you traction in the axis of the outlet or the axis of the pelvis, wherever the head may be, without any tension whatever upon the perineum.

There are several other points that I would like very much to refer to, but as our time is limited I shall make no further remarks other than to state that I am in full accord with the expressions of Drs. Reamy and Hardon.

REPORT OF A CASE OF HEPATOTOMY FOR BILIARY OBSTRUCTION, WITH REMARKS.

By W. E. B. Davis, M.D.,
Birmingham, Ala.

Mrs. S., aged sixty years, of Mississippi, was brought to Birmingham in April of this year for treatment. She had suffered from attacks of epigastric pain, with tenderness over the liver for several years, and for six months had been confined to bed or to her room with more frequent attacks, followed by increased jaundice. The pain would extend to the lower dorsal and upper lumbar regions. With each attack, which for a few weeks had occurred once or twice daily, there would occur a chill, with a temperature from 103° to 104° F. In the early part of May I was consulted and made the diagnosis of movable stone in the common duct and advised operation without delay, the patient's condition having already become very unpromising. She was removed to our private hospital and the operation performed on May 16th. It revealed a gall-bladder and cystic duct about the size of the little finger, the duct at first sight appearing to be a part of the bladder. The omentum was attached to the bladder, but there were no adhesions in the region of the common duct. The bladder was friable and gave way easily on manipulation with the forceps. After the calculi from the bladder and cystic duct had been extracted a good-sized stone was located about the middle of the common duct by introducing a metal sound. With the finger on the outside of the duct the stone was found to be freely movable. I was able to pass a long forceps through the bladder into the duct and seize the stone, but it was

accidentally broken into three parts before removal. The delivery was accomplished with comparative ease. After its removal I passed a flexible sound without difficulty into the duodenum. By the most careful examination there seemed to be nothing left in the duct. The gall-bladder, which was, as already stated, very much contracted and friable, could not be attached to the abdominal parietes; in fact, it was so much diseased that it became necessary to remove a good portion of it. A glass tube was introduced into the cystic duct and the gall-bladder secured around the tube, gauze being used around the field of the operation. The tube was removed in forty-eight hours and the gauze gradually withdrawn after four days. Bile ceased to flow temporarily from the fistula in two weeks, and the rigors and fever returned; but after probing the fistula it began to discharge with the disappearance of the symptoms due to its obstruction. It continued to escape for six weeks after the operation, yet the stools revealed the fact that bile was passing into the intestine. On two occasions I plugged the fistula with gauze, and a chill and fever occurred each time. After the fistula closed the patient returned to her home in Mississippi. She had gained a good deal in flesh since the operation, and continued to improve, being able to do some housework, until the latter part of September, when all the symptoms of biliary obstruction recurred. She returned to Birmingham after she had suffered for two weeks, and I found her condition very extreme from cholæmia and exhaustion. The chills were frequent and the temperature high. To add to the gravity of the case she had a very severe attack of dysentery soon after her arrival. Her condition was so grave that I was not warranted in removing her from her boarding-house to the hospital. With very short anæsthesia I opened the original wound, which had been made below the border of the ribs, and, by separating the adherent abdominal viscera from the liver region, was enabled to reach the liver without getting into the general cavity except at the attachment of the omentum

to the abdominal parietes, which was easily walled off. I was at first unable to locate the very contracted gall-bladder, which had been enveloped by the liver tissue, and inserted sharp-pointed scissors into the under surface of the right lobe in two places, which incisions were enlarged with the index finger, with the escape of bile from both openings. After this had been done I found a place that felt suspicious of being the gall-bladder, and a puncture proved it to be so. It was not larger than a chestnut. Gauze was introduced tightly, which controlled the bleeding but permitted the escape of bile, which discharged very freely. The fever and chills disappeared at once. After four days I introduced an electric cystoscope, and by carefully sponging out the bile was enabled to see it discharge from the two incisions in the liver as well as from the gall-bladder. The patient after more than a week died from exhaustion; but the openings in the liver, as shown by the cystoscope, would have given relief from biliary obstruction without the opening in the bladder. I am sorry to have to report that I was unable to secure a post-mortem, notwithstanding the fact that I made extraordinary efforts.

In order to define the indications for the operation and to give my experience with this procedure, I reproduce my remarks on the subject presented to the American Association of Obstetricians and Gynecologists, September 17, in my address as President:

"The operation is indicated in cases of obstruction with enlarged liver, where the gall-bladder or ducts cannot be isolated or the patient's condition from exhaustion and cholæmia will not permit of a protracted search for the bladder or ducts. It will be only exceptionally called for, and the cases will be fewer as the surgeon's experience increases in choledochus operations; he will then be enabled to better locate the bladder and ducts so much changed by inflammatory processes. After the patient has been relieved of cholæmia by the escape of bile from the incision in the liver an operation with less danger may be done for the

removal of the obstruction in the duct. In addition to the above indications I think the operation should be resorted to in hepatitis before it has reached the stage of pus formation if the liver does not rapidly become smaller after drainage of the biliary reservoir or the ducts. My attention was first attracted to the value of the procedure in a case in which the amount of pus removed was not more than one-half ounce, but in which the division of the biliary canals resulted in the escape of large quantities of bile for many weeks.

"The patient was seized with violent pain over the region of the gall-bladder, and required a hypodermic of morphine, one-quarter grain, before being relieved.[1] The liver was tender and extended an inch and a half below the margin of the ribs. The skin was slightly discolored. There was nausea and some vomiting. The temperature was 102° F. in the afternoon; on the next day 99.5° F. in the morning and 100.5° F. in the afternoon. The pulse was less than 100. The daily temperature remained the same for a week, everything pointing to an abscess of the liver. On October 28, 1898, one week after the attack, the abdomen was opened and the right lobe of the liver aspirated, not more than one-half ounce of pus being removed. I made an incision, and with the finger searched for this small cavity; in so doing a wound of considerable depth and great size, perhaps two inches in length, was produced. There was very profuse hemorrhage, which was controlled by iodoform gauze packing. The liver tissue gave way under the packing, making the wound much larger. The patient stood the operation well. A large quantity of bile was discharged through the gauze, necessitating the frequent change of dressings. The bile continued to pass in large quantities for three weeks and in small quantities for another two weeks—about the amount usually discharged in a case of cholecystostomy. The liver rapidly decreased in size, and the patient is in better condition now than for several years. The extensive

[1] "Wounds of the Liver and Biliary Tract." Transactions of the American Association of Obstetricians and Gynecologists, vol. xii.

wound of the liver evidently assisted in his recovery by severing the small biliary canals and emptying the liver.

"I did a hepatotomy on the following case with choledochus stone :[1] Mrs. S., of Shelby County, aged twenty-eight years, consulted me in December, 1898. She had suffered from attacks of epigastric pain and fever for four months. There was some tenderness elicited by pressure over the liver, the margin of which extended to midway between the ribs and umbilicus. There was no enlargement of the gall-bladder. Several attacks of pain would occur in a day or a week, coupled with slight jaundice. There would be nausea and some vomiting. The chills and fever simulated malaria. The diagnosis of a stone, loose in the common duct, was made. Operation was advised as soon as the present attack was over. In a few days, however, she was seized with violent pain in the right hypochondriac region, with fast pulse—130 to 140—temperature 103° F., and vomiting. The peritonitis was localized. It was decided to perform a drainage operation to bridge the patient over, and subsequently the operation to remove the stone. There were extensive adhesions to the under surface of the liver, which were partly separated. There was no pus around the liver, but great bleeding occurred, which was controlled by gauze packing. The right lobe of the liver was aspirated, and it was thought that some pus was removed, but a more thorough examination showed that this was incorrect. A free incision was made in the right lobe, which was followed by considerable bleeding. Iodoform gauze was packed in the liver wound. There was considerable discharge for some days of a dark, bloody fluid, not a great deal of bile. The liver returned to its normal size in a few weeks, but there were occasional recurrences of epigastric and subscapular pain, with fever, showing that the stone was still in the duct. The spleen became very much enlarged four months after the operation. About two months later, when the patient

[1] "Wounds of the Liver and Biliary Tract." Transactions of the American Association of Obstetricians and Gynecologists, vol. xii.

had decided to have the radical operation for the removal of the stone, it was passed. Patient was entirely relieved.

"Hepatotomy was done in the following case[1] for the relief of cholæmia in obstruction of the hepatic ducts: Mrs. H., of St. Clair County, was referred to me by Dr. J. W. Ash, Springville, Ala., December, 1898. The patient was aged sixty years. Six weeks previously, without great pain, she rapidly became jaundiced. The jaundice gradually became more intense. The liver extended almost to the umbilicus. There were no nodules to be made out. The patient's condition was extremely unpromising, and no encouragement was given the family. An exploratory operation was done December 31st, and the gall-bladder was found empty and quite white. No stone could be made out in the common duct. A thorough investigation of the under surface of the liver was not made, owing to the very critical condition of the patient and the size of the liver. However, it was evident that the obstruction was in the hepatic duct or its branches. The bladder was attached to the abdominal incision more to anchor the liver than otherwise. An incision was made in the right lobe, and the bleeding was free, but was controlled by iodoform gauze packing. The patient lived five days, and died from exhaustion. I had hoped to sever some of the biliary canals, and thus drain the liver until the patient was somewhat relieved of cholæmia. There was a free discharge of very dark-colored bile. The autopsy revealed a large malignant nodule in the transverse fissure, which completely obstructed the branches of the hepatic duct. The biliary canals throughout the liver were very much distended.

"In July and August of this year, 1898, I conducted a number of experiments on dogs to determine the value of incisions in the liver in relieving biliary obstruction.[2] Five dogs were killed and the liver injected with fluid either

[1] "Wounds of the Liver and Biliary Tract." Transactions of the American Association of Obstetricians and Gynecologists, vol. xii.

[2] Experiments were conducted at the Birmingham Medical College, and I was assisted by Dr. R. E. Hogan, Assistant Professor of Gynecology and Abdominal Surgery.

through the gall-bladder, the common duct having been tied, or through the common duct. Incisions were then made in all parts of the liver, with the result that streams of the fluid would issue from the bile canals, and there was general oozing of the fluid from the wounded surfaces of the organ if much force were used. Six dogs were anæsthetized and the liver injected as above, and this fluid with blood would flow, as a rule, freely when much force was used in injecting the fluid. Four had the common duct tied, and after twenty-four hours the same experiment was conducted under anæsthesia, with similar results. In nine the common duct was ligated and gauze packed around the field of the gall-bladder and ducts. After from twenty-four hours to a week the liver would be incised in one or more places, and as a rule the bile escaped satisfactorily through the gauze. It would be very dark after prolonged obstruction. Two of the dogs died, and the others were killed in from five days to two weeks after the second operation. Before killing them, and while under the anæsthetic, fluid was injected through the bladder or duct, and would flow from the wounds which had been made in the liver at the second operation, and also from incisions made at that time. Five had the gall-bladder removed and the cystic and common ducts ligated, but as gauze was not used at the time of the operation to wall off the general cavity, they died in from twenty-four to forty-eight hours from shock and from the escape of bile.

"Other experiments were conducted, but they added nothing to the above. While, as I have stated, the field for hepatotomy in gallstone diseases is very restricted, yet in those few cases it offers the surgeon much assistance in bridging the patient over until in better condition for a radical operation."

DISCUSSION.

Dr. Edwin Ricketts, of Cincinnati, O.—I have been greatly pleased with the paper of Dr. Davis. This contribution is characteristic of him when we consider the experimental work he has done in the past upon the bile ducts of animals. I want to call attention to the fact that some ten years ago, when I reported some cases at a meeting of this Association held in Louisville, Ky., I, at that time, mentioned in my report a procedure which I was very glad to hear Dr. Davis had successfully carried out, namely, passing a probe through the common duct into the duodenum, although I was severely criticised at the time for so doing. In one case of hypertrophy of the liver I had under consideration I deliberately opened the abdomen, incised the liver to the extent of four inches, depleted it to some extent, closed the incision with interrupted silkworm-gut sutures, and had no trouble whatever. The patient lived three years, and died from cirrhosis of the liver. Hepatotomy in these cases and for these conditions, for the reasons advocated, is commendable. It is a life-saving procedure. We can relieve the engorged condition of the liver, and later do a secondary operation, if necessary. This is surgery that is up to date. In some of these cases the gall-bladder is so contracted that we are very much puzzled to know what to do, even though we do not have an enlarged liver, and yet I think in these cases, as in many other departments of surgical work, each case is a law unto itself. I think it is best to open the duodenum and explore the common duct, as suggested by Hans Kehr, even washing out or catheterizing one of the hepatic ducts, after the manner suggested by that gentleman.

As to the control of hemorrhage, I was very glad to hear Dr. Davis answer the question of Dr. McMurtry during the reading of his paper, to the effect that hemorrhage can be controlled nicely by gauze pressure, which is a fact.

There is no one subject, according to my way of thinking, which presents more opportunities for surgery than that of diseases of the bile ducts and operations on the gall-bladder and ducts. Now, we can go a step further, as suggested by the essayist, and resort to hepatotomy in selected cases. So many faulty diagnoses have been and are made that this procedure will clear

up, as well as others which may be employed. Diagnoses, such as neuralgia of the stomach, neuralgia of the duodenum, and all manner of things, are now being cleared up by surgical work along this line.

Dr. Robert T. Morris, of New York City.—A good proportion of the cases we have in common with gall-bladder surgery are lost on account of cholæmia and its complications. If we can relieve the engorgement of the liver by making a preliminary incision, it is a matter of immense importance. Among the valuable papers that have been read at this meeting, the contribution of Dr. Davis is one of the most important and interesting. If we can, as a preliminary step, remove the bile from the liver, so that it is not absorbed by the lymphatics, or the patient is not poisoned by it, even if we are obliged to do an extensive operation later, we will have done a life saving measure.

The matter of making an incision into the liver need not be feared on account of hemorrhage. When we first began to suture kidneys many surgeons were afraid of the hemorrhage; when the parenchyma was cut, it bled profusely for a minute, but if we kept about our work, and paid very little attention to it, in a moment or so it stopped. We were afraid of our lung abscesses. I have operated on patients when it became necessary to devote nearly as much attention to the trembling students as to the patients themselves. The same thing holds true in regard to the liver. In liver surgery, many surgeons when they cut the parenchyma they will make unusual efforts to arrest the hemorrhage. If they forget it, the hemorrhage will continue for a little while, then stop. Sometimes the hemorrhage is so profuse in these cases for a short time that it looks as though the patient were going to bleed to death; but if we let it alone, the patient will get along all right.

The two points I wish to make are these: First, the relief of the engorged liver is a matter of immense importance to us as surgeons; second, we need not fear hemorrhage, which is so often feared by surgeons in surgery of the liver. We should make our incision on the anterior surface. In a recent case, where the liver was enlarged with a very adherent gall-bladder, it seemed wise to go through the liver, and after making an incision on the anterior surface directly through the lobe it was an easy matter to arrest hemorrhage afterward, because we could

compress from below, and it only requires a little pressure to stop hemorrhage from the parenchyma of the liver.

Dr. F. W. McRae, of Atlanta, Ga.—The paper read by Dr. Davis is most timely. He has called our attention to this subject before, and Mr. Mayo Robson, in his book on *Diseases of the Liver and Gall Ducts* directs attention to the subject in another class of cases which were referred to by Dr. Davis. I have had experience in one of those cases. In this particular class of cases, where we get into the gall-bladder, remove the obstruction, and still have a greatly enlarged liver that is immensely engorged, where there is a tendency to the formation of abscess, failure to do what Dr. Davis has recommended will frequently necessitate a subsequent operation. I saw one case where the gall-bladder was drained and the obstruction removed, but the enlarged and congested liver was not incised. A subsequent operation evacuated a considerable quantity of pus. The patient could have been saved much suffering and great danger had the procedure which Dr. Davis has suggested been done at the same time as was the operation on the gall-bladder.

Dr. George H. Noble, of Atlanta, Ga.—I do not feel like saying much on the subject, for the reason that Dr. Davis has presented it so clearly and satisfactorily, and he has done more work in this direction than I have. I heard Dr. Davis' paper in Havana, and at that time expressed my opinion that this was a very good and satisfactory procedure. I am fully in accord with the principle advanced by him of draining the liver, enabling us to bridge our patients over and to subsequently relieve them of their pathological condition by the procedure he has suggested. I fully appreciate the importance and practicability of draining the liver in the manner he has explained, and in the few instances in which it has been my pleasure to employ it have secured most satisfactory results.

Dr. Alexander Hugh Ferguson, of Chicago, Ill.—I wish to compliment Dr. Davis on his admirable paper. If time permitted, I thought possibly I might have an opportunity of discussing hepatotomy for hydatids and for abscesses of the liver. I have treated a number of cases of hydatids of the liver among the Icelanders, and I removed considerable portions of the liver. If a free incision is made in the liver, it is surprising the enormous amount of bile that escapes from it, whether we have hydatids or some other pathological condition to deal with.

Dr. L. McLane Tiffany, of Baltimore, Md.—It seems to me the contribution of Dr. Davis is an extremely valuable one to the history of hepatic surgery. We know that the congested liver is best drained through its ducts, or preferably the gall-bladder, which is easier to reach. We know that by draining the gall-bladder the liver materially decreases in size. We know that if the gall-bladder cannot be reached, that by incising one of the ducts, the cystic duct, or more commonly the common duct, the liver will practically decrease to its normal size, and it would be interesting to know whether Dr. Davis has had an opportunity of observing this in those cases in which he has resorted to hepatotomy; whether the congestion or increase in size of the whole liver has diminished, or whether only one area of the liver has decreased in size.

Dr. Davis (closing the discussion).—I appreciate the fact that there is a great deal to be done in connection with this subject. My work has been simply preliminary. It is not by any means conclusive or final. In a measure it is only suggestive. I have not gone into the technique of the operation, because I have varied it from time to time. This will be perfected by those who take up this work. The point I wanted to make particularly is this, that in these cases where we cannot reach the gall-bladder or the main ducts we should open the liver and drain it for biliary obstruction. After the patient has recovered from cholæmia and exhaustion, if the duct has not been cleared, a radical operation should be undertaken for the removal of the obstruction.

As to the question of Dr. Tiffany, drainage is accomplished by the bile passing down in the hepatic ducts and being dammed back through the incisions. The reduction in the size of the liver was uniform in my experiments; it made no difference whether I drained in one or more places.

The question was raised by Dr. McRae of incising the liver before abscess formed. In the first case I operated upon I found only half an ounce of pus, but there was a free discharge of bile. That suggested the operation of hepatotomy to me in cases where the gall-bladder could not be reached.

(*a*) BOUGIE REMOVED FROM THE ABDOMINAL CAVITY. (*b*) RUPTURED UMBILICAL HERNIA.

By Joseph Taber Johnson, M.D.,
Washington, D. C.

I offer for your consideration a brief description of two rather unusual but still very practical and important cases which have recently occurred in my experience.

The first case was that of an unmarried young lady, about twenty years of age, who had "loved not wisely, but too well." As a result of her indiscretion she found herself pregnant, and, with the advice and assistance of her lover, found a medical man who consented to produce an abortion, at about the tenth week of gestation, by inserting into the uterus a No. 8 flexible bougie. Some difficulty was experienced in getting it to pass the internal os, as I learned later on; but finally, after persistent effort, it passed in suddenly, and was pushed up nearly its entire length, leaving perhaps two inches protruding into the vagina. The bougie was supposed to be coiled up in the uterus. Its expulsion was prevented by a cotton tampon pushed high up in the vagina. The patient returned to her home, and upon some pretext went to bed. During the night pains came on; they gradually increased in intensity, until they reached a climax, when they ceased entirely. In the morning a physician was called, to whom the patient made a confession, and begged him to keep her secret from her family. He did the best he could under the embarrassing circumstances. He informed me that when he removed the tampon, the fœtus and a portion of the membranes came away also. He made a vigorous

attempt to remove the remaining shreds and pieces of membranes with his finger, assisted by the curette. He was unable with the most diligent search to find the bougie, and finally came to the conclusion that it must have slipped out, without her knowledge, during one of her visits to the closet in the night.

The second day after the abortion the patient had a severe chill, followed by a considerable rise of her pulse and temperature, with gradual but steady increase of abdominal pain and distention. I was requested to see her in consultation, on the morning of the third day, when I learned the points in the history narrated above. I was requested by the attending physician to still further curette the uterus, as he feared her condition had been caused by the absorption of septic material from possible decomposing membranes which he had been unable to remove in his hasty and imperfect curettage. The doctor thought I might also find the missing bougie. The patient was etherized, put on an improvised table, and, after the usual preparation, a uterine sound was introduced by way of exploration. Nothing was felt in the uterus ; but with the gentlest possible handling of the instrument, and without the slightest use of force, it went on and on until only the handle remained outside of the os uteri. One of two things was evident—the sound had either perforated the uterus or had passed through an opening already made, presumably by the missing bougie. This latter was considered the most probable. The sound was slowly withdrawn, and a loose antiseptic tampon was inserted in the vagina. Believing that the bougie was in the peritoneal cavity, I recommended immediate abdominal section for its removal. The patient agreed to this rather startling suggestion, with only one proviso, namely, that her parents should never know the cause of her peritonitis. She was at once removed to a hospital and the abdomen opened as soon as the necessary preparations could be made. After a little search the bougie was found, almost entirely folded in and covered over by the omentum, in the effort of nature

to repair the damage and prevent injury to the abdominal viscera. Flakes of gray lymph and considerable grayish fluid were wiped out of the cavity. The opening in the uterus had become so thoroughly closed that it was not found. The abdomen was closed without drainage, and the patient made an unusually rapid and uneventful recovery. I saw her recently at a patient's house, looking the picture of blooming health, and she informed me that she was perfectly well.

I have seen a number of different injuries, in consultation, from the effects of attempts to produce criminal abortion, but never one like this. I have known of quite a number of cases where the uterus has been perforated by the uterine sound, and also by the curette in routine gynecological practice; but I have never seen an instance of a bougie, used for the purpose of inducing premature labor or abortion, perforating the uterine wall, and subsequently passing clear up through it and disappearing in the abdominal cavity.

Several of our text-books mention cases and give illustrations of the perforation of the uterus by laminaria tents, used to dilate the cervix uteri, with fatal effect. On page 243 of the August number of the *American Journal of Obstetrics* is the report of a case very similar to mine, by Dr. P. F. Chambers, one of the surgeons to the Woman's Hospital of the State of New York. The operation performed, however, was decided upon after consultation with two of the consulting staff. They all agreed that the case was one of osteosarcoma, although there were present an unusual number of leucocytes (21,000). An exploratory cœliotomy was advised. The following is Dr. Chambers' description of the operation:

"On Thursday, April 25th, I made the median incision, thinking that I could get at the median tumor better by that route. Upon opening the abdomen I found the two masses firmly fixed and extending from each mass up toward but back of the transverse colon—a cord-like band of what we took for a chain of lymphatics. Determined to explore the central mass, and get a specimen for examination, I cut into

it, and, to my surprise, saw a white, glistening substance, which I caught with forceps and pulled out. This substance was a silk gum-elastic bougie, No. 8. One end of it was coiled up, resting against the pubis, inclosed in a mass of inflammatory tissue, the other end against the crest of the ilium. The recovery has been uneventful. My first impression regarding the rubber tube was that it was a catheter which had been lost in the bladder and had worked its way through, but upon inspection I found it to be a bougie, and at once expressed my belief that it had been used to produce a criminal abortion."

After her recovery the doctor learned that his suspicion was correct, the patient having confessed that she had visited an abortionist last November; that a "rubber thing" had been passed into her uterus for the purpose of causing an abortion. The day following her visit to the abortionist she missed the "rubber thing" and returned for an explanation, thinking something might be wrong; but she was told that she had probably dropped it out without noticing it, and thus reassured she dismissed the matter from her mind. In December she noticed a tender lump in her side, but did not enter the Woman's Hospital for its removal until the following April. She had then carried this "rubber thing" in her abdomen for about six months.

Dr. Marion Sims, while in charge of this same hospital, many years ago, removed a female silver catheter from a woman's abdomen in the presence of a number of the members of the International Medical Association. The hospital report of the case does not state that the instrument was used to produce an abortion, but that is a fair presumption. Dr. Chambers also reports as another of the traditions of this hospital, that "about twenty years ago a woman came to Dr. T. Gaillard Thomas and told him that ten days before she had attempted to produce an abortion at her home in Indiana by passing the steel rib of an umbrella into the cavity of the uterus (as she had done before), but that after passing it far up it had suddenly slipped from her fingers, as though

it had been grasped from above and pulled out of reach. Dr. Thomas could not feel the steel, but, as she had repeatedly assured him of the truth of her statement, he consented to operate. The husband of the woman, however, protested, saying that he did not believe such a "cock-and-bull-story," and that if death resulted he would hold the doctor responsible. Of course, the operation was not performed. That night the patient began to show pneumonic symptoms, and two days later she was dead. At the post-mortem examination a steel umbrella rib, thirteen inches long, was found in the abdomen, one end having perforated the diaphragm and extended two inches into the lung tissue."

I have no doubt that experiences similar to those just narrated may have occurred in the practice of some of the Fellows of this Society. From the severe acute symptoms in my case it is reasonable to believe that if prompt relief had not been afforded by an operation she would have died of the rapidly progressing peritonitis, which seems to have fortunately been nipped in the bud.

The second case to which your attention is very briefly invited was also new and quite exceptional in an experience of somewhat over a thousand abdominal operations. It was a case of ruptured umbilical hernia, in which several feet of intestine had been out on the surface of the abdomen and covered with unsterilized cloths and bandages for at least seventeen hours. The patient was a fat, strong Irish woman, who assisted her husband in the management of a beer saloon. She was the mother of several grown children, and was fifty-seven years of age. She had had the hernia for fifteen years. A few days before the rupture she had a severe pain in the "bunch," as she called it, and put a heated stove-lid wrapped in flannel over it. It turned out to be hotter than she thought, and burned her slightly. The tissues, not being in a normal condition, did not heal readily, and ulcerated over an area about the size of a quarter of a dollar. She called in her family physician, to whom she made so light of her trouble that he did not even examine

it, but prescribed a little oxide of zinc ointment and told her to let him know if it did not heal or if it gave her any further trouble. Several days later, while straining at stool, she felt something give way at the site of the hernia, and quite a mass came out. She covered it over with a dirty flannel petticoat and went up stairs to her bed. This was about 7 P. M., September 24, 1901. She did not send for her physician until eleven o'clock. He came to my home about midnight, in great alarm. We agreed that with the depressing symptoms existing, together with the fact that the woman was somewhat intoxicated, an operation at that hour of the night, and in her very unsanitary environment, would not be likely to result in success for her or in any credit to surgery. I gave the doctor a package of sterilized gauze and towels, and suggested their use with hot sterilized salt solution. He returned and did the best he could to keep the parts warm and clean and the woman quiet. I saw her the next morning, and finding her in a much better condition than I expected, securely tightened up her bandages and had her removed to a hospital, where an operation was performed at 12 o'clock, which was as soon as the necessary preparations could be made, just seventeen hours from the rupture. It required at least fifteen minutes to detach the cloths which we found over the protruding omentum and intestines. They seemed to have grown onto and into them. The intestines were very dark and very cold and very dirty. A thorough cleansing and warming with hot salt solution succeeded finally in getting them and the adjoining skin of the abdominal wall into a tolerably fair condition. About a pound of omentum was removed, which was bleeding in a number of places from which the adherent cloths had been detached. The tight rim encircling the protruding gut was incised above and below and the three feet of intestine returned to the abdominal cavity, which was subsequently filled with the hot salt solution. A rather long and difficult operation was then performed for the radical cure of an old umbilical hernia in a very fat abdominal wall. The woman

gave every promise of getting well for seven days, then she suddenly grew weak and collapsed, and died on the eighth day, apparently of a general septic peritonitis. She had no pain, and her mind was clear until she breathed her last. The trouble occurred about the same time as the sad tragedy in Buffalo, and the patient frequently remarked that she was running a race with the President, and from the cries of the newsboys in the streets she kept fairly well posted as to his daily progress. The race was about even for a week, and they both reached the goal about the same time and after giving promise of better things for several days. These cases of ruptured umbilical herniæ are very rare. Several of our modern text-books on surgery do not mention the subject at all. Marcey, in his large book on hernia, mentions only one case (p. 191), which he quotes from Boyer in 1834, who, in his *Treatise Upon Surgical Diseases*, describes a case, as follows: "A woman, aged sixty years, had been afflicted with umbilical hernia for twenty years. In lifting a basket the skin was torn to the extent of six or eight lines, and the intestine escaped. Five hours after the accident I was called, and found that an intestinal loop, ten inches in length and distended with gas and almost violet-red in color, had escaped through the rent. The pulse was weak and the countenance visibly changed. It was impossible to return the intestines without enlarging the opening. I had made only a small incision, when so large a quantity of intestine escaped that it was with great difficulty returned, and I was obliged to suture the skin in order to retain it. The patient grew worse, and died at the expiration of twenty hours." It does not appear that any attempt at a radical cure was made in this case, as only the opening in the skin was sutured in order to retain the intestines within the abdominal cavity.

Cases of Hernia.

No.	Author.	Where reported.	Case.
1	Pilkington, H. Ormskirk, Eng.	Lancet, London, 1890, vol. i. p. 1008.	Woman, 73; 8 in. of intestine out 4 hrs.; operation consisted in enlarging opening, reducing gut, and stitching up abdomen; recovery.
2	Arnold, Phys. in Seckenheine.	Arrezlich, Mittheilungen, Aus. Baden, 1860, vol. xiv. p. 7.	4-year old child; the whole small intestine (?) lay free on the abdominal wall; child died 2 hours later; no operation allowed by parents.
3	W. B. Barham, Newsome, Va.	Med. News, Phila., 1882, vol. xli. p. 288.	Woman, 43; multip.: weight, 250 lbs.; 20 feet of small intestine lying by her side in bed; had been out several hrs.; rupture early in morning; operation 4 P.M.: died from exhaustion in about 2 hours.
4	Agnew.	Princ. and Prac. of Surg., vol. i. p. 497.	Quoted by Dr. Barham. Irish woman.
5	R. B. Bontecou.	American Medical Monthly, New York, 1858, vol. x. pp. 341-344	Woman; a large mass of omentum and intestine by her side on a coarse flannel skirt, had been out 5 hours; enlarged opening and reduced bowel; gave opiates; recovery; has since given birth to a child; hernia never reappeared.
6	Fiber, C. Wien.	Wien. Med. Bl., 1881, vol. iv. pp. 1484-1486; also in Med.-Chir. Centralbl., Wien, 1882, vol. xvii. p. 398.	Woman, 50 years old, well nourished, 2 hours standing; did not complain of pain; tear in belly wall 12 cm. long; a convolution of intestine on the abdomen; enlarged opening with bistoury and reduced gut; died in 24 hours.
7	A. Boyer.	Handbuch der Chir., Wurzburg, 1840, Bd. viii. p. 297.	Woman, 60 years, very fat; 10 inches gut were out for 15 hours; enlarged opening and reduced; died in 20 hours.
8	O'Leary, C. Providence, R. I.	Boston Med. and Surg. Journ., 1875, vol. xciii. pp. 182-184.	Woman, 54; 30 inches of large intestine, some small; fell on street, walked ½ mile home with guts held up in underclothing; out about 18 hrs.; gave ether; enlarged opening, reduced and sewed up abdomen; lived 5 days.
9	Porcher, W. P.	N. C. Med. Journ., Wilmington, 1883, vol. xii. p. 266.	Negro girl, 13 years; 2 hours omentum protruded; reduced; skin sutured; recovered.
10	Schuuhr.	Med. Zeitg., Berlin, 1836, vol. v. p. 215.	Woman, 40 yrs., small, slender; abdomen covered with intestines and omentum bound together by lymph and bands; had been out 5 days. Broke up adhesions with his hands; prolapsed part consisted of trans. colon, part of descending colon, and omentum. Enlarged opening with bistoury and reduced; skin sutured; complete recov.
11	Hempsted, H.	Brit. Med. Journ., London, 1900, vol. ii. p. 1640.	Man, 60 years, well nourished; 1 yard of small intestine and mass of omentum protruding, had been out for 4 hours; operation under ether; death in 24 hrs.
12	Lawson, G. Middlesex Hospital.	Lancet, London, 1890, vol. ii. pp. 560-562.	Woman, stout; intestine out for 10 hrs.; operated on; died in 12 hours.

No.	Author.	Where reported.	Case.
13	McKone, J. J. Tacoma, Wash.	Medical News, Philadelphia, 1891, vol. lviii. p. 719.	Woman, 49 years; 34 inches of small intestine out for 18 hours. Punctured gut before reducing, irrigated abdomen, left in glass tube; recovered.
14	M. Mersinne, quoted by Lawson.	Journ. de Méd., Chir. et Pharm., Paris, 1765, vol. xxiii. p. 557.	Woman; died six weeks after rupture.
15	Holmes Coote, quoted by Lawson.	Lancet, 1894, vol. ii. p. 276.	Woman; intestine protruded; recovery after operation.
16	Wallace.	Ind. Med. Gaz., Calcutta, 1881, vol. xvi. p. 340.	Middle-aged male, sparely built, seen 49 hours after protrusion of gut. A large coil of intestine coated with lymph; enlarged incision and reduced gut; aseptic operation; recovery.
17	Crosby Leonard.	Brit. Med. Journ., January 11, 1868, p. 29.	Woman, 32 years; omentum protruded 5 inches long, time 24 hours; ligated and cut off; old opening sutured; recovered.

FOREIGN BODIES IN ABDOMEN.

No.	Author.	Where reported.	Case.
1	Kempferdick, W.	Deut. med. Woch., Berlin, 1881, vol. vii. pp. 49–59.	Young widow said that 7 days before she had pushed a goose feather into her uterus and it slipped away from her. Operation found a feather 19 cm. long above promontory of the sacrum; died in 24 hours.
2	W. G. Wylie,	Medical Record, New York, 1892, vol. xi. p. 513.	Miss J., 25 years; Nov. 29, 1891, introduced glass rod, 6½ in. long and ⅓ in. thick, into uterus, slipped in, and she miscarried Jan. 10, 1892. Jan. 27, operated on, and found the rod in left lumbar region. Recovered.

The lessons to be learned from the cases of ruptured umbilical hernia just reported would seem to be, first, that no matter how many hours—even up to the end of five days—the omentum and several feet of the intestines had been outside of the body, recovery was possible through their replacement and retention, by operation; second, recovery in these cases, at least, resulted most frequently when only the skin was sewed together and the operation for permanent cure postponed for future consideration.

DISCUSSION.

Dr. Virgil O. Hardon, of Atlanta, Ga.—I do not recall ever having seen a case similar to the one reported by Dr. Johnson. I have seen some severe injuries following attempts at criminal abortion, but none in which the uterus had been perforated and peritonitis set up, as he describes. Neither have I seen a case of ruptured umbilical hernia; therefore, I do not feel qualified to enter into any discussion on this subject.

Dr. Samuel J. Mixter, of Boston, Mass.—The first case reported by Dr. Johnson of ruptured umbilical hernia is rather uncommon. I desire to mention one case that came under my observation. A young woman, thirty years of age, stout, having a large umbilical hernia, was brought into the Massachusetts General Hospital one afternoon, having felt that morning, while engaged in washing, something wet on the abdomen under her clothes. Instead of spilling some water from the tub against her she thought of this large umbilical hernia, which she had had for some time, which had ruptured through a small ulcerated spot which had been caused from chafing, and a large quantity of peritoneal fluid escaped and soaked through her clothes. A considerable piece of omentum was found hanging out of the opening. She was prepared as quickly as possible, and operated on immediately. The omentum, as in all of these cases, was adherent. There was no intestine outside the hernial sac, and I simply tied off and cut off a large mass of omentum (I should say two or three pounds of omentum), including that which had been on the outside, and, closing the hernial wound, she recovered without any trouble. In this case the operation was simple, because only the omentum was exposed, and it was possible to cut that off, to get rid of it entirely, with all its septic covering as well as the skin about the opening.

Dr. W. L. Rodman, of Philadelphia.—I wish to congratulate Dr. Johnson on the result obtained in his first case. The woman would undoubtedly have been lost but for his prompt diagnosis and surgical intervention. I have not seen a case similar to the second, but within a year I saw a case which I anticipated might result in the same way that his did. The patient was a large, fleshy woman, weighing at least 250 pounds. She had an enormous umbilical hernia, which had been reducible for many years,

and the skin over it was upon the verge of ulceration. This led me to fear that it might ulcerate through and cause a fatal termination. Just at the time when the woman was deliberating whether or not to undergo an operation for the radical cure of the umbilical hernia it became strangulated. She gave her consent, and an operation was done. At that time I was more than ever convinced of the great danger, if not the probability, of a spontaneous rupture of this large and greatly distended sac. The skin was as thin as tissue paper almost, quite adherent to the sac, and I am sure it would have ulcerated in a short time. However, she made a good recovery from the operation for strangulated hernia.

Operations for strangulated umbilical herniæ are among the most serious we have to do on account of the dense, cartilaginous ring and the constriction of the tissue within the sac. In my own experience they have been the worst cases I have been called upon to operate. The sooner they are operated the better. I believe that in these cases the operation devised and practised by Dr. Mayo, and which I had the pleasure of seeing him do last June, is the best operation we possess for the radical cure of umbilical hernia, inasmuch as it enables the surgeon to bring the flaps together and overlap them, and in that way prevent recurrence. Anyone who is skeptical as to the ultimate results of radical cure operations in these cases would do well to investigate the operation of Dr. Mayo, of Rochester, Minn., which is perhaps the best yet devised.

Dr. J. W. Long, of Salisbury, N. C.—Some time ago I was asked to see a woman in an adjoining town who gave this history: One week prior to the day I saw her, believing herself pregnant, and for the reason that she expected company in a little while and did not want to be so large when her company was present, she introduced a pencil into her uterus with a view to producing an abortion. She was a married woman. Two days afterward, while in the toilet-room, she was suddenly seized with abdominal pain and hemorrhage, not very profuse, and fainted. She was shortly afterward put to bed, and restoratives were applied, but she quickly developed fever, peritonitis, and delirium; hemorrhage continued from the uterus, though not a great deal. When I saw the patient there was an active general peritonitis, with extreme tympany, delirium, and pulse very frequent and feeble. I will not go into the details of the case except to say

this, that while she gave a very clear history of rupture of the uterus, after considering the case in all its bearings, I ventured the diagnosis that she had a ruptured ectopic pregnancy. I had her removed to the hospital, and operated on her at once. A free incision was made through the vaginal cul-de-sac, the fingers introduced, and the placental mass and blood clots removed. The ruptured right tube was brought down, tied close to the cornua, and cut away. The wound cavity was carefully cleansed and gently packed with gauze. The woman made a good recovery. It was not a case of rupture of the uterus, but one of ruptured ectopic pregnancy, which gave a history of rupture of the uterus from an attempt at abortion.

I want to say further that these two groups of interesting cases which Dr. Johnson has so carefully depicted are exceedingly instructive, and will ever serve as a basis to us from which to draw conclusions, and to which we can add our future experience along these lines, and, personally, I thank him for having brought these subjects before us.

A MODIFIED HODGEN SPLINT.

ITS USES IN THE TREATMENT OF FRACTURES OF THE THIGH AND OTHER INJURIES AND DISEASES OF THE THIGH AND LEG.

By George S. Brown, M.D.,
Birmingham, Ala.

The apparatus known as Hodgen's splint was evolved from the Smith anterior splint. The Smith splint was bound to the anterior aspect of the thigh and leg by interrupted turns of a roller-bandage, by means of which the limb could be suspended, but without extension. Hodgen widened the splint so that the limb would go between the sides of it, and then, instead of running a roller-bandage around the whole, he merely passed them underneath and pinned them from bar to bar, making a hammock of them. He then adopted the adhesive strips and foot block of the Buck apparatus to secure the limb in the hammock, and thereby get traction on the limb when the splint is suspended at an angle. These two simple changes in the Smith anterior splint transformed it from a crude suspension apparatus, affording no useful amount of extension, into a most useful instrument that affords extension in an ideal manner. I have made other slight changes which have rendered the apparatus most satisfactory to me in all the variety of uses to which I have put it. These changes, mentioned in the order of their importance, are, first, the canvas hammock in one piece, used in place of the underlapping strips of roller-bandage; second, the plaster-boot with the incorporated canvas strips, to be used in place of the adhesive strips and foot block. I

have added the spring scales to the suspension cord above in order to determine the amount of extension afforded and to give a comfortable elasticity to the whole. I have also added the tent blocks to the cords attached to the splint frame, by means of which we can nicely regulate the evenness and direction of the traction. I have also added the two rings at the distal end of the frame for the passage of the canvas strips.

For one who has used this splint it is difficult to understand why it has been so long neglected for the more troublesome, uncomfortable, and less effective Buck apparatus, Physic's long splint, and the plaster-of-Paris dressings. The principal reason for this neglect seems to be that a written description of it does not adequately explain it; good evidence of this is that those surgeons who have come at some time or other within the radius of Dr. Hodgen's personal influence are the ones who use it most; in short, those use it who have seen it used. With the exception of the article by Dr. H. H. Mudd in Park's *Surgery*, the text-book mentions of Hodgen's splint are always third or fourth in order of importance, and are so incomplete as to lead one to strongly suspect that few of the writers had ever seen the apparatus applied; some of them, indeed, still dismiss the subject with Hamilton's words regarding Smith's anterior splint—*i. e.*, "No suspension apparatus can ever afford any adequate amount of extension."

The iron frame is best made of three-sixteenths inch iron or No. 4 wire. This frame should be long enough to reach from a level of the perineum to four or five inches beyond the sole of the foot. It should be bent slightly at the knee at the time of applying it. The transverse section across the sole of the foot is continuous with the side portions, and is five inches wide. The width of the upper end is regulated to suit the case by a detachable arch which connects the inner and outer side-bars over the thigh at the perineum. There is a wire ring soldered to each side-bar opposite the middle of the thigh, one on each side at the middle of the leg and one at each distal corner. This frame is practically the same that has always been used, the only difference is that I have added the rings at the distal

corners for the passage of the canvas strips which take the place of the adhesive strips and foot block. These canvas strips[1] are incorporated in a plaster boot, which is applied in the following manner: The foot and leg are covered thickly with cotton-batting, which in turn is covered tightly and smoothly with a roll-gauze dressing. Upon this is applied one layer of plaster bandage from the toes to the knees. The canvas strips, reaching from the middle of the thigh to six inches beyond the sole of the foot, are now laid along the lateral aspects of the thigh and leg and covered in with two or three more rollers of plaster bandage, thus incorporating them in the plaster boot. After the boot and canvas strips have been applied the canvas hammock, attached to the iron frame, is slipped under the limb (as the assistant lifts it with a gentle pull) and pinned to the outer bar of the splint temporarily.

The four small cords attached to the frame are now looped over the hook of the spring scales, which is hung from the ceiling, on a stout cotton rope. This suspension rope is run over a pulley, which can be attached to the ceiling, a bracket on the wall, or to a frame or gallows, made for the purpose, which stands on the floor at the foot of the bed. The length of this rope from the pulley to the hammock should be at least eight feet, and should have on it a tent block, by means of which the hammock can be raised or lowered.

When the leg, covered by the plaster boot, has been placed in the hammock, the foot should be pulled down, until the inner bar of the frame rests close against the pubes, and the distal end of the canvas strips passed through the rings at the distal corners of the frame and tied in a bow-knot across the sole of the foot. The hammock, now holding the limb firmly fixed in it, is slowly elevated until the whole swings clear of the bed. The pins along the outer side are now readjusted to make the hammock fit evenly and comfortably under

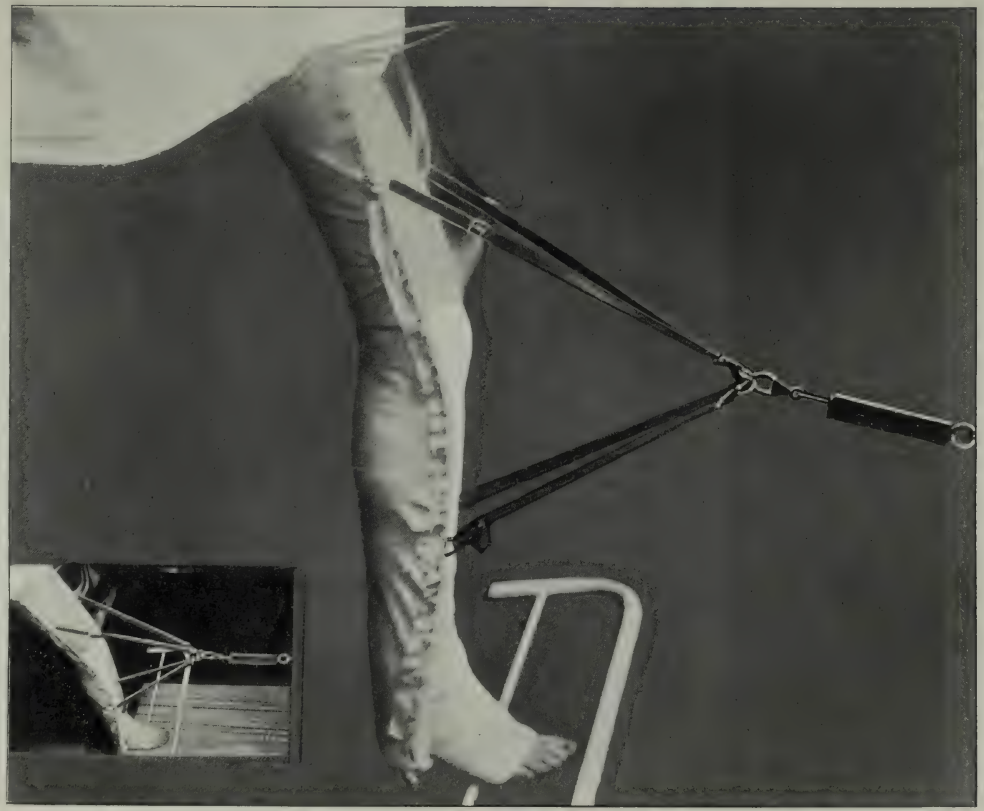
[1] If the leg is carefully shaved and cleaned strips of adhesive plaster will do just as well except in cases where there are wounds on the leg. Unless the leg is thoroughly cleansed the plaster may cause a dermatitis. Owing to the muscular atrophy the plaster boot gets loose and has to be changed once or twice.

the limb, and the small tent blocks are adjusted to make the weight equal on the small cords.

In order to determine the amount of traction applied the bed should be moved until the suspension cord hangs exactly perpendicularly and the weight of the whole noted as indicated on the spring scales. Now by moving the bed toward the head the weight on the scales will be increased and the difference will be the amount of traction exerted. With a limb weighing twenty-five pounds this will be about six pounds when the suspension cord is at an angle of fifteen degrees from the perpendicular. The foot of the bed should, of course, be elevated to secure counter-extension, and if the leg is not heavy enough a sand-bag should be laid across the frame. The weight of the limb thus increased pulls against the angle of the cord, and the resultant traction is in a more horizontal direction and avoids too much lifting on the cords attached opposite the thigh. I have treated a child of six in this way with a perfect result.

After the limb has been at rest a few days the leg shrinks a good deal, so that the whole pull comes on the instep, malleoli, and heel tendon; consequently it is very important to have the cotton quite thick about the ankle. If this is done properly the boot will not have to be renewed more than once during the five or six weeks of treatment. I was led to substitute this boot for the adhesive strips in a bad case of infectious dermatitis caused by the latter. I now use the adhesive strips as explained in the footnote.

In the Buck method a very much greater amount of traction is necessary than with this suspension apparatus, for the obvious reason that in the former enough weight must be applied to overcome the friction of the leg and thigh on the bed before any traction is exerted on the muscles about the seat of the fracture. This is usually all that can be borne (fifteen or twenty pounds), but rarely ever enough to prevent shortening. It is true this friction is lessened by elevating the pulley at the foot of the bed, over which the traction cord runs until the foot and calf rest but lightly or not at all upon the bed, but just in pro-



A modified Hodgen splint.

portion as this is done does the Buck apparatus pay homage to the suspension principle.

With the Hodgen apparatus the friction is between the limb and the canvas hammock, and this actually *aids* the traction instead of *retarding* it, so much so that if the patient could keep perfectly still it would be sufficient of itself to maintain the required pull of six pounds. Painful, clonic spasms of the thigh muscles are seldom met with except in children, and are due to the limb being too light to afford sufficient extension. In such cases a flat sand-bag spread out over the front of the thigh (which is otherwise always uncovered for inspection) will answer the double purpose of controlling the spasm and, by giving weight to the whole, prevent its recurrence. To enumerate the advantages of this appliance, those of first importance, of course, are the results. I think the testimony of all surgeons who have given it a fair trial would be that they had had practically no shortening. Such good results are due to the even and constantly acting pull, and cannot be obtained if the pull is not even and constant; and with no other method that I know of can this be assured.

Secondly, I think union is facilitated by the exercise the patient gets, and because there is no pressure on the seat of fracture. (Angulation is, I think, impossible, but is always guarded against by the front of the thigh always being uncovered for inspection.)

Thirdly, I would mention the comfort to the patient and the labor saved the nurses who take care of him. My patients have been allowed to sit up to eat and to use the bed-pan and urinal; in fact, they move about as they please, and even lift themselves from one bed to another when it is rolled alongside. *No matter what the movement of the patient, provided it is within the range of motion of the hip-joint, the seat of fracture is absolutely undisturbed. The frame, canvas, and limb above and below the fracture swing as a solid whole between the suspension cord and the ligaments of the hip-joint.*

The last patient I put in this apparatus illustrated this most convincingly. He had lain for a week with a fracture about

three inches below the great trochanter dressed with a long side-splint. He had suffered so much every time anyone even came near the bed that he had repeatedly evacuated his bowels and bladder in the bed for fear of being moved if he should make his wants known. He begged fearfully not to be touched, but we managed to put his limb in the Hodgen in about ten minutes without hurting him at all, and then surprised him very much by showing him that it could be swung from side to side of the bed without causing him any pain. The four inches of shortening he had with the long splint was all pulled out by the next day, and he had a perfect result in four weeks, *i. e.*, union with no shortening.

I have treated twelve cases in all of simple fracture of the thigh, with no shortening that was perceptible. One other case was no doubt the same, but it could not be proved because the other thigh had been amputated at the time the one treated was injured. Two of these patients were children, aged six and twelve years, and although they were rarely quiet a minute while awake, the result was perfect. One boy of sixteen years, with a fracture through the trochanter, on account of having no pain, doubted the diagnosis, and could not be managed at all. He even got out of bed on his sound foot repeatedly. He has about one and a half inches shortening.

One patient, a man sixty-six years of age, had an intra-capsular fracture, and was treated with the Hodgen merely for the comfort it gave him. He put it on and off for three or four weeks, as the whim took him, and then abandoned it. He has three inches shortening.

One of our patients was a man six feet three inches tall, who weighed 260 pounds. He was an engineer, and in the railway wreck which fractured his thigh he sustained a great many cuts and bruises, particularly on the leg of the injured side, so that no extension boot nor plasters could be applied for ten days. The limb was swung up at once, however, and the friction of the heavy limb on the hammock allowed enough extension to make him comfortable. After the first few days he sat up in bed for his meals, bathed himself, used the bed-

pan, and had his bed made up daily without even any discomfort; in fact, he was always anxious to get at this morning exercise, because he enjoyed it and because he could then recline on the head-rest the balance of the day and read and write as he pleased.

Another patient sustained a simple fracture of the right thigh and a crush of the left, necessitating amputation near the upper third. The stump suppurated, and it is easy to see that it would have been a very troublesome wound to dress had the right limb been tied down with the Buck extension and sandbags. As it was, the fractured limb in the hammock was pulled up a few inches and a pillow placed under the buttocks, and the stump could then be dressed with very little trouble.

One patient got his thigh caught between the draw-heads and sustained a compound comminuted fracture of the middle third of the thigh, together with extensive laceration of the skin and muscles. As the artery was still beating, numerous free incisions were made in the skin; two large masses of protruding muscle were cut away, fragments of bone removed, the broken shaft united with two silver plates and screws, gauze drains inserted, the whole enveloped in a hot carbolized dressing and swung up in a Hodgen splint *without* extension. For three or four weeks the sepsis was most severe and the hot dressings were changed every four hours, and new points of infection had frequently to be incised; all of which was done with very little trouble in the handling. When the thigh had to be operated upon or dressed it was our custom to elevate the limb by means of the pulley and tent block and slip a hard pillow under the back and sound hip. Then, when the upper or thigh part of the hammock was unpinned, that part of the iron frame would tilt up out of the way, and, while the leg was comfortably supported in *its* half of the hammock, the fracture was held in place by the silver plates, and the dressing of the wounds was rendered comparatively easy. Anyone who has treated such a suppurating thigh without a suspension apparatus can readily see what a help it was in this case in dressing the thigh and in the

use of the bed-pan, and in being able to easily change the position of the limb and to otherwise make the patient comfortable. I think it probable that without this splint this patient would have lost his limb and possibly his life. The wounds healed with the plates *in situ*, and he has one inch shortening.

In three of the rooms in my private hospital there are brackets on the wall for the suspension of the Hodgen splint, and we have gradually come to use it on all legs that hurt. I have found it most useful in the after-treatment of five cases of hip-joint resection, one of the knee, one operative case of fractured patella, three of operation for non-union of the tibia, six compound fractures of the tibia, and five or six of osteomyelitis of the tibia. We have also used it often in cases with severe contusion and infection, as in other cases, for the comfort given the patient. It simply removes a painful limb from all contact with things that can jar it, even from contact with the patient's body itself. A patient with an inflamed leg lying on a pillow who cannot move without suffering agony may often be made perfectly easy in a few minutes by having the painful member swung off the bed. When a patient asks to have his leg taken out of the swing it is always a good indication that the sepsis is getting better.

In closing, I wish to repeat that the surgeons who use this apparatus are those who have seen it used. Seeing it *demonstrated* is not, however, I am sorry to say, seeing it used. It lacks the testimony of the patient. It may make clear the principle of action, but it gives no full idea of the really wonderful efficiency of the Hodgen splint in obtaining the best results, in the comfort given the patients, and in the very much lessened amount of work to the nurses and attendants.

DISCUSSION.

Dr. Manning Simons, of Charleston, S. C.—I am very glad Dr. Brown has presented this splint to us, and has demonstrated its application, because it has been a favorite method with me for a long time in treating fractures of the thigh. I have treated

a great many cases of fracture by this splint. I can indorse in every way what Dr. Brown has said of it. He has not spoken too enthusiastically about its advantages. It is particularly applicable to fractures of the upper part of the thigh, and especially to those very troublesome cases that formerly were described as intracapsular fractures in old people. I have two patients under my care at the present time in the hospital, one, a young patient with a fracture of the middle of the thigh; another, an old woman, eighty years of age, with a fracture of the neck. These patients have complete freedom of movement of the body. I managed to get her out of bed, at the end of four weeks, on a chair. I have treated many cases of fracture of the neck of the femur with this splint. It is particularly applicable to fractures in the upper part of the femur, where we have the upper fragment tilted up by the muscles which act upon the upper part, and the most careful application of Buck's extension will not enable us to bring the ends together. I refer to those fractures below the lesser trochanter of the femur, where the psoas and iliacus muscles tilt the upper fragment, and by means of Buck's extension or any other splint, for that purpose, we can pull, and yet we will have the upper fragment tilted in this way. We have noticed a more or less angular splint, which enables us to bring the lower fragment up to the upper one. I think this splint is applicable to fractures below the lesser trochanter.

I would also say that in compound fractures of the thigh this splint can be used with great advantage. I know of no more troublesome fracture to deal with than a compound fracture of the thigh under ordinary methods of treatment, because we have to disturb the relations of the bones every time we dress the wound, and union is delayed, but with this splint you can get at the wound and dress it easily. I have in mind the case of a boy, a race-rider, who sustained an injury on the race-track, fracturing his thigh, both ends of the bone coming out through the skin. I got the end of the bones into proper relation, and as the boy had been hurt some hours before I saw him, and no effort had been made to keep the wound clean and to prevent it from becoming infected, I thought it well to drain. I passed a drainage-tube through the wound made by the accident, made a counter-opening, and washed out the wound daily without the least difficulty, or soiling the bed, or interfering in

any way with the dressings. He made an excellent recovery. If any of you were to see him walk, you would hardly know that he had a fracture of the thigh.

I have made a little different application of the splint from Dr. Brown. He puts the splint on with the long arm on the outside; I use it in the opposite way, and put the long arm on the inside. I have found that some of my patients complained that the upper end of the inner rod pressed on the perineum, and it stands to reason. If you examine the splint, you will find that the upper end goes beneath the perineum, and when you have considerable extension the splint will be pushed up and that end of it will be jammed against the perineum. Therefore, I have changed the method of application of the splint, putting the long arm on the inner side and bending it over the abdomen. I have had great satisfaction with it, and those who have never used this splint, if they adopt it for that class of fracture, will be thankful for this addition to their armamentarium.

Dr. D. F. Talley, of Birmingham, Ala.—I wish to add my testimony to the usefulness of this splint. The first case I used it on was one of a simple fracture of the tibia. The injury was sustained at one of the mines; the wound had become infected, and had to be opened. Several fragments of bone had to be taken out on account of necrosis. Of course, the dressings which were applied had to be changed so often that I found it inconvenient and cumbersome to the patient. I had seen this splint used in Dr. Brown's hospital, and therefore had one made for this particular case. The splint did not disturb the dressings very much, and added a great deal to the comfort of the patient. He was confined to bed for a number of weeks.

Later on I had a case of fracture of the neck of the femur in a woman, thirty-seven years of age, and I put her leg up in this splint. I first tried the application of the plaster-of-Paris boot Dr. Brown was using, but at the time she complained of so much pain in the instep and above the heel that I had to take it off and substitute rubber plaster for it. After I put on rubber plaster she did not suffer any more. I kept her confined on her back for eight weeks, then allowed her to get up and go home. At the time she left the infirmary she had one-half inch shortening. I consider this a good result for fracture of the neck of the femur.

Besides getting good results in not having shortening of the limb, the value of this splint can hardly be imagined so far as the comfort of the patient is concerned. Patients can move themselves all over the bed; they can pull themselves up and slide down a little, if necessary. They can move themselves from side to side, and the splint is very useful in any injury of the leg where we have to apply a dressing and the leg is bound in an uncomfortable way to the bed. Where the limb is suspended a little higher the patients can move themselves up without the nurse doing it. They can raise themselves up and use a bed-pan without any assistance. The bed linen can be readily changed, and it makes everything much easier of accomplishment. I believe it is the best splint one can use in fractures of the thigh anywhere, and obtain good results. Aside from that, it is very useful in treating any injuries of the leg, where you have to apply a plaster-of-Paris bandage, where the leg is heavy, and lies in one position on the bed constantly; the patient gets tired of one position. I suspend simple fractures of the tibia in this splint.

I have treated cases of fracture of the neck of the femur with it, and I recall one case I treated with it particularly; I do not know whether it was an intracapsular fracture or not, but it was above the trochanter. I treated an old fracture of the neck of the femur with it which had been neglected for a number of months, where there was a shortening of three or four inches. I applied the splint in that case merely for traction; I put on a good amount of traction, about ten or twelve pounds. In that case the leg was extended until it was about as long as its fellow. So it is surprising that the use of this splint has been so limited, considering the good results that we get from it, and considering, also, the comfort it gives the patient.

The first time I saw the splint was in Dr. Brown's hospital, and I had never seen it used anywhere else until I commenced using it in my infirmary. In travelling over the country and in visiting different hospitals I never saw it used. While I was in Europe, however, I visited Guy's Hospital in London, and learned that they used it universally there. They not only used this splint for injuries of the leg, but for fractures and injuries of the arm. They seemed to be very much pleased with the results obtained by its use, and particularly the comfort that it gave patients.

Dr. W. L. Rodman, of Philadelphia, Pa.—I have been much interested in this old friend brought to us in a new dress by Dr. Brown, and it goes without saying that he has materially improved the Hodgen splint as we have heretofore considered it. Undoubtedly it is one of the most valuable mechanical appliances used in the treatment of fractures, and one that has been overlooked by many of us in the treatment of fractures of the femur. I believe, from the demonstration made by Dr. Brown to day, and especially after the warm words of commendation of this splint by Dr. Simons and Dr. Talley, I shall be tempted to use it more in the future than I have in the past. In truth, I can see that it has a valuable field of usefulness in the treatment of compound fractures. I believe that we have been at a serious disadvantage in treating these fractures with plaster-of-Paris or by some other methods of treatment. I think that if we used this splint in many of our cases we would get along much better and would obtain more satisfactory results. I believe this splint can be used to great advantage in injuries, simple and compound, about the knee. I can see a valuable field of usefulness for it there. In compound fractures of the leg its use would possibly be better than anything else, but I have preferred what is known as the Pennsylvania fracture-box. I can see how, theoretically, this splint will be applicable to fractures high up as well as to fractures low down, say below the middle of the femur, but I take it there would be a greater tendency for shortening in fractures high up. Of course, that is only theoretical; I have not tested it, and therefore cannot speak of it from a practical stand-point. This leads me to say, that I would take exception to one remark made by Dr. Brown, namely, that there is no shortening in a relative sense. Personally, I believe that all fractures of the femur in an adult, however treated, will be followed by appreciable shortening, if measurements are accurately made.

In oblique fractures of the femur there must always be a certain degree of shortening, not great, it is true. In children I have seen a minimum of shortening. But in the adult I have never seen a fracture of the femur treated by any method without at least half an inch or three-quarters of an inch of shortening.

This method is undoubtedly an admirable one in treating fractures of the thigh in old people, for the reason that it is the most comfortable and best splint one can possibly devise. I am sure

it will give all of these cases the greatest amount of latitude so far as movement and comfort are concerned.

I feel that we are greatly indebted to Dr. Brown for having presented and described this splint and pointing out its field of usefulness; yet I would like to say a word or two in favor of Buck's extension apparatus. I do not believe in parting with old friends when they have served me well. I have had the best results from Buck's extension treatment. I like it very much, and I have not found it so uncomfortable and so disagreeable to the patient as some have apparently, from the way they have spoken this afternoon. Perhaps it does not insure the comfort of the patient to the same degree that this modified splint does, but at the same time it is a satisfactory method of treating fractures of the femur. You can regulate extension and counter-extension without difficulty, and you get perhaps a less amount of shortening with Buck's apparatus. Still, I am much pleased with the demonstration of Dr. Brown, and I shall make use of the splint when I go home.

Dr. Robert T. Morris, of New York City.—I would like to ask Dr. Brown whether he has ever used this splint in cases of excision. It seems to me its application would do away with the muscular spasm that necessitates the use of spikes and wiring. It strikes me that from a mechanical point of view we might avoid that spasm of the muscles in many excisions.

Dr. F. W. McRae, of Atlanta, Ga.—Personally, I am very much obliged to Dr. Brown for this demonstration. I learned to use Smith's anterior splint from my association with the elder Westmoreland. It has always seemed to me that Smith's anterior splint and this apparatus worked on the same principle. With Dr. Brown's modification, which is better than the original Hodgen splint, we will doubtless be able to meet the indications in fractures of the neck of the femur better than by any other plan of treatment. Because of the attachment of the large gluteal muscles, when we put the limb in a straight position there is a tendency toward pulling out and separating the upper from the lower fragment, which is a good reason why a double inclined plane should be employed. The application of Buck's extension to a fracture in that vicinity has seemed to me to separate the fragments more widely than the Smith anterior splint or the Hodgen splint. I saw a number of these cases of intracapsular fracture in my student days that were treated by

the elder Westmoreland. I believe there is an anatomical reason why we should have these fractures in elderly people, and we can feel practically sure that we have them when there is a fracture of the neck of the femur in old people where the neck is attached more transversely to the shaft of the bone. I believe in intracapsular fractures. I have seen such cases in the practice of the elder Westmoreland, and I know people who obtained practically perfect results in cases of intracapsular fractures where Smith's anterior splint was used. I have had occasion to use this splint several times myself in this very disagreeable class of cases. The advantages claimed for the splint demonstrated by Dr. Brown are that it enables patients to move about. They are not so liable to contract pneumonia as when you tie them down. I have been very much pleased with the demonstration.

Dr. Hugh M. Taylor, of Richmond, Va.—Like the other members of the association, I feel that we are very much indebted to Dr. Brown for this admirable demonstration, because while I have seen this splint referred to, not, of course, the modification of Dr. Brown, I have not seen it practically demonstrated. The Hodgen splint has been brought to our attention for many years. I am glad to see it practically demonstrated. I can see a large field of usefulness for it in fractures below the trochanter. But, like Dr. Rodman, I am opposed to going back on an old friend that has given me excellent results. In fractures at the small part of the neck of the femur and in fractures at the base of the neck I have not obtained as good results. On the contrary, I have told these patients that I could not promise them good results; that I could only give them fair results, but would do the best I could for them. If I have a fracture at the small part of the neck of the femur in an old woman, I say to her that the best I can promise you is that you will be able to get up and walk about on crutches for a long time. If we have a fracture at the base of the neck, with impaction, our whole interest in that case is centred on that fact; we don't want it unimpacted, because if it is impacted the patient has a reasonable chance of getting firm, fibrous union, if not bony union; not so at all if there be a fracture at the small part of the neck. I have uniformly used Buck's apparatus. I would like to achieve the results Dr. McRae claims to have obtained by the application of the Smith anterior splint. The best I can promise to do for such a patient is to get him up on crutches for a good many

months; in some few instances I have had them dispense with the use of crutches and walk with the aid of sticks. In compound fractures below the trochanter, I agree with what Dr. Rodman has said, that we need not expect, as a rule, to get perfect apposition and perfect union in an oblique fracture. On the other hand, these patients must expect more or less shortening. In a child with a transverse fracture we can sometimes get perfect apposition and a minimum degree of shortening. But Buck's apparatus answers a good purpose in the treatment of fractures at the small part of the neck and in fractures at the base of the neck. I am particularly anxious not to have too much traction made, but depend largely on sandbags to keep the limb quiet.

Dr. W. O. Roberts, of Louisville, Ky.—In 1870, while I was attending lectures at Bellevue, there was a discussion between Dr. Sayre and Dr. Hamilton as to whether or not shortening always occurred in fractures of the thigh. One contended that in an oblique fracture of the thigh there was always some shortening, which might not be detected immediately after union had taken place, but if measurements were made after the patient was up and about, even if the shortening was not noticeable at the time he was discharged; if a careful examination was made some months after he was out, in every instance shortening would be detected. One or two patients were brought before the clinic who had been discharged with apparently no shortening; measurements were therefore made, and shortening was shown to exist. Therefore, I believe with Dr. Rodman that in all cases of oblique fracture of the thigh there is some shortening; it may not be appreciable; it may not be noticed without careful examination.

I have listened with a great deal of interest to the discussion as to the usefulness of this splint. I never have tried this or Smith's anterior splint, and I must confess that my treatment in fractures of the lower limb, it matters not where they occur, whether of the leg or femur, has been by the use of plaster-of-Paris, and I have never had any cause to regret the use of this method. I believe a properly applied plaster-of-Paris dressing is the best of all others in fractures of the lower extremity, wherever they may occur. When this dressing is properly applied there is no need for any extension and counter-extension.

As to fractures of the leg, in our section of the country, where plaster-of-Paris is used as a dressing, it is only a matter of days before the patient is up and on crutches; we do not need any apparatus to enable him to move around in bed.

HERNIA OF THE OVARY—INGUINAL.

By William P. Matthews, M.D.,
Richmond, Va.

Herniæ of the ovary in the inguinal region are not uncommon. Numerous cases have been reported by various authors of hernia of the ovary alone or of the ovary and tube together, occurring in the inguinal region as a congenital condition or as the result of a strain or accident. The great majority of cases are congenital, double sided, and associated with other congenital abnormalities or defects of the generative organs. They usually undergo some circulatory disturbances such as hemorrhage, blood-cysts, cystic degeneration, pus formation, angiosarcoma, in fact, presenting almost all kinds of pathological changes. They may even be atrophied (usually enlarged). A case recently operated on by me presents a most interesting and unique history:

Miss I. E., aged seventeen years, five feet six inches high, weight 145 pounds, strong and robust; was born with a "swelling" in each inguinal region, which did not occasion any alarm or produce any inconvenience until she reached her fourteenth year, when they began to enlarge, and at intervals grew so tender as to confine her to bed for two or three days. Pressure on them produced that characteristic pain and nausea. She never menstruated. This fact was concealed from me for unaccountable reasons until discovered at the time of the operation.

I operated for the relief of this hernia on August 16th at the Old Dominion Hospital, following the Bassini method. The sac was firmly adherent to the internal ring and to the adjacent

part of the canal. The sac was opened and a tumor enclosed in several layers of fascia was exposed, carefully dissected out and examined. It proved to be an adenoma of the ovary, though it looked more like a testicle than an ovary. The specimen consisted of four distinct parts: (*a*) An oval, flattened body 6 cm. long, 3 cm. wide and 1.3 cm. thick; (*b*) a cystic tube 5.2 cm. long, one end being dilated—this was joined in part to the body by fibrous connective tissue; (*c*) parallel and beneath was another tube which entered the body; (*d*) perpendicular to this latter tube was a third tube which also entered the body.

Upon section the body showed a grayish-red surface with one white, well-isolated tumor. The microscopical examination made by Dr. Greer Baughman is attached hereto. Examination revealed the fact that there was absence of the uterus. The ovary was removed and the parts closed in the usual manner, and the patient left the hospital in three weeks.

Inquiry into her family history revealed these most interesting facts: Her great-grandmother was an only daughter. She was twice married and bore children in each union. Of the female descendants of the first marriage there were eight that were never unwell in their lives, and all lived to be over twenty years old. Of the second marriage there was one of the two daughters who was never unwell. Two aunts of the patient have never menstruated, and one has a double reducible hernia (inguinal). Five first cousins of the patient have never menstruated and two of these are ruptured just as she was. One sister of the patient has never menstruated and has a reducible hernia on the left side and irreducible on the right. One fact I learned is that these women who have never menstruated have hardly any hair in the axillæ and on the pubes, and are not troubled by any unpleasant odor from the perspiration.

Microscopical Appearance. Hardened and cut in collodion; stained with hæmatoxylin and eosin, and examined with Bausch & Lomb $\frac{2}{3}$ and $\frac{1}{6}$ objective, 1 inch eye-piece. One section was taken so as to include the white tumor on the inside of the oval neoplasm, with the following microscopical appearance:

The main tissue is composed of three elements: (*a*) A scanty amount of separating fibrous tissue; (*b*) masses of epithelial looking cells arranged in broad, irregular shaped masses, nuclei stain but poorly; (*c*) numerous epithelial looking cells, whose nuclei stain strongly with hæmatoxylin; they are separated from the surrounding cells by fibrous tissue and have a tubular arrangement. In places these tubules are arranged in such a way as to form tubular acini. This neoplasm is plentifully supplied with bloodvessels and is right well separated from the small tumors by means of fibrous connective tissue.

The small tumor is made up largely of the tubules of epithelial cells with the well-stained nuclei; these tubules, though close together, are separated by fibrous connective tissue. These tubules are curved but do not seem to divide. The mass of epithelial cells with poorly stained nuclei are absent.

Another section from the main tumor has the same appearance as that first described. A section made from the parallel tube shows nothing but numerous bloodvessels held in place by loose areolar tissue.

From the literature we find that hernia ovarii is not so uncommon and that the ovary frequently undergoes some pathological change. The microscopical appearance of the specimen excludes the possibility of its being a local fibroma or a myoma, an adenoma of the intestines or an enlarged lymph gland. The shape and position as well as the clinical symptoms point to the possibility and probability of its being an ovary. The microscopical appearance leads us to diagnose the neoplasm as adenoma ovarii.

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DISCUSSION.

Dr. J. W. Long, of Salisbury, N. C.—I thank you for inviting me to discuss Dr. Matthews' paper, but I am utterly unable to make a good discussion on this paper. The case reported with its family history is a unique one. I have occasionally in my work run across a single instance of a woman who did not menstruate, but I have never seen such a collection or group of non-menstruating women in one family or anything that approached it. I congratulate the Society on having Dr. Matthews put these cases on record, and I hope he will follow the history of these women. I did not hear the essayist say whether or not any of the non-menstruating women bore children.

Dr. Matthews.—They did not.

Dr. Long.—Sometimes a woman bears a child without ever having menstruated. I hope Dr. Matthews will have the same success with the second case that he had with the first.

REPORT OF TWO RECENT INTERESTING CASES.

Loss of Base of Bladder, Plastic Operation. Ovarian Cyst in a Negress Complicated by Fibroid of the Uterus.

By Southgate Leigh, M.D.,
Norfolk, Va.

LOSS OF BASE OF BLADDER, PLASTIC OPERATION.

J. J., female, aged sixteen years. December 15, 1900, was confined and attended by midwife. Very long, tedious labor. Head on perineum several hours. Finally delivered spontaneously. Was brought to St. Vincent's Hospital, January 3, 1901, in a wretched physical condition. Examination showed a profuse, offensive vaginal discharge, produced by a large slough of the anterior wall of the vagina. When this slough came away it was found that the patient had lost about two-thirds of the vagina, the whole of the cervix, and the entire base of the bladder. As the parts healed up the vagina was practically obliterated, and the urine poured directly from the ureters through the vaginal outlet. Even after several weeks of tonic treatment there was still so much suppuration that I found it impossible to get the parts clean; I therefore thought it best to remove the tubes and ovaries, in order to stop menstruation, hysterectomy being out of the question on account of sloughing of the cervix. This operation she stood well, and made a good recovery. I then sent her home to give further time to improve her healing power and stop the suppuration of the parts.

Her condition, both general and local, being much better, in August, 1901, I undertook to close the parts by a plastic operation. I first opened the bladder above and inserted a "T" tube for drainage. I next split the perineum, as for a Tait's operation for perineal laceration. The incison was made long, and the flap was carried up and under the edge of a flap of mucous membrane previously loosened above, this upper flap being close to and including the meatus, which, fortunately, had escaped injury. The suturing here was done with catgut sutures. Next the sides of the wound were brought together laterally by deep sutures of silkworm-gut.

The patient was kept on the side and face for about a week, during the whole of that time the urine running out of the suprapubic drain by a long connecting tube to a vessel below; then the drain was removed and the upper wound allowed to close. Sutures were left in about two weeks. The result has been perfect. The patient has good control of the sphincter, and can retain the normal amount of urine in the bladder without discomfort.

OVARIAN CYST IN A NEGRESS COMPLICATED BY FIBROID OF THE UTERUS.

M. E., aged forty-five years. Has borne three children, the youngest twenty years old. Sent to me by Dr. Fletcher Drummond, of the Eastern Shore of Virginia, and was admitted to St. Vincent's Hospital July 21, 1901. Family history negative. Previous history: Menstruation began early in life and was regular up to three years ago, when it ceased entirely. Present history: Five years ago began to notice a tumor in the right iliac region. This gradually increased in size. Œdema of the feet and legs at times.

When I first saw the patient at St. Vincent's Hospital and palpated the abdomen I suspected ovarian cyst; but remembering the rarity of this affection in negro women the diagnosis remained somewhat in doubt, and especially when

vaginal examination revealed a hard mass in the pelvis. On account of the presence of considerable albumin in the urine and marked debility of the patient I thought it best to aspirate some of the fluid, which was done on two occasions (August 30th and September 15th), withdrawing eleven and nine quarts, respectively. After this her strength improved steadily, and on September 28th she came to operation. On opening the abdomen there was found a large ovarian cyst springing from the right side by a rather broad pedicle, but with no adhesions. The pedicle was tied off in sections and the mass easily removed. On examining the left pelvis a very curious complication was found in the shape of a fibroid about the size of an ordinary orange, attached to the left side of the body of the uterus and completely covered in the layers of the broad ligament. This was peeled out of its nest and dissected off from the uterus. Some little difficulty was experienced in completely checking oozing from the uterine wound, which had finally to be packed with a strip of iodoform gauze. The patient collapsed somewhat from the operation, but quickly reacted and made an easy recovery. The packing was removed on the second day, and the lower suture, previously left untied, was brought together. This did not prevent a perfect healing of the whole wound. At this writing, four weeks after the operation, she is sitting up and practically recovered.

I report this case on account of its rarity and the peculiar complication. In this connection I would state that for the past year I have entirely discontinued the use of calomel and salts in moving the bowels after laparotomies. With many operators the fear of the bowels not moving promptly in such cases has been a "bugbear," and I am frank to admit that I am not free from anxiety on that point myself. I do believe, however, that many of the difficulties attendant upon moving of the bowels, and especially the nausea and vomiting, have been due to the disgusting remedies that have been employed. Why gynecologists for years have stuck to calomel and salts—remedies which even in health

are nauseating in the extreme to many people—is a mystery to me. I believe that almost any other remedy is better. For my own cases I find that such simple medicines as lapactic pills or cascara pills work beautifully. Since beginning their use I have hardly any nausea to contend with, and rarely have to give a high enema to aid them. An ordinary low soapsuds enema, with a little turpentine added, usually produces the desired result.

DISCUSSION.

Dr. Virgil O. Hardon, of Atlanta, Ga.—I have been much interested in this paper, for the reason that, although I have been doing abdominal work for sixteen years in a section of country where we have many negro women, I have yet to see a genuine case of ovarian cyst in a negress. I have seen parovarian cysts, or cysts of the broad ligament, but I have never seen a genuine ovarian cyst which originated in the ovary and could be demonstrated to be such. I do not say that it cannot occur, but out of several hundred negro women whose abdomens I have opened for various causes I have yet to see the first ovarian cyst. I do not know what is the reason of this; I don't think anybody knows, except that it is a peculiarity of the race.

There is one point I wish to refer to, and that is the best method of moving the bowels after abdominal operations where the necessity for moving them exists. Any man who has had considerable experience with abdominal sections must undoubtedly have met with cases where this was difficult of accomplishment. Salts is a valuable remedy, although it is nauseating. I believe there is no remedy which so depletes the bloodvessels of the abdomen and of the pelvis, and thereby lessens liability to peritonitis after the abdomen has been opened, and for that reason I regard it as exceedingly valuable. There is no doubt that in the ordinary run of cases, where there are no complications, other laxatives may do equally well. There is a class of patients, however, to whom we cannot give salts or pills or any remedy by the stomach. Those are the patients who vomit after they come out from under the influence of ether, and they continue to vomit after the effects of the ether have disappeared. On the second or third day the vomit becomes green in color

and the abdomen becomes distended with gas. Those are the cases where an urgent necessity exists for having the bowels to act, and it is almost impossible to get them to act. Now, there is one remedy which I have used very frequently in the last nine years, and I desire, on account of its great value, to call the attention of the Association to it, and that is the alum enema. I sent to all of the members of this Association a reprint of an article I read on this subject before the Medical Association of Georgia last spring. The enema consists of an ounce of powdered alum dissolved in a quart of warm water, which is approximately a 3 per cent. solution. It usually causes expulsion of gas in from five to fifteen minutes, but in some cases a longer time is required. I am sure by the use of this simple remedy I have saved lives of patients who were in a critical condition after abdominal section. I have never known it to fail to move the bowels. I believe it is far superior to the other remedies that are used for this condition.

Dr. George S. Brown, of Birmingham, Ala.—I want to say a word or two about purgatives after operations. There is one point I have not seen referred to very much, if at all, and that is the supposed benefits following purgation. I do not think purgatives do harm very often after abdominal operations, except in inflammatory cases. If we have an extensive localized peritonitis, such as we sometimes have after evacuating an appendicial abscess, and wiping it all out, after removing the appendix there is quite an area that is badly infected, and we may have to put in two or three drains in different directions. It is absolutely impossible, as a rule, in many of these cases for any purgative to move the bowels. It has been my observation that whenever the bowels move it is an indication the patients are better, and not that the purgatives have helped them. There may be sufficient paralysis of the bowels to keep them still, owing to the extent of inflammation and adhesion, and you cannot make any purgative go through. The peristaltic wave goes as far as the paralyzed portion, and then returns and results in regurgitation and vomiting. My experience has been that if you let the patient alone for three or four days, until this is all walled off, the bowel will move of its own accord. Of my last twenty-five cases of appendicitis I have lost but one, and that case was in the country, and I think death was largely due to the efforts made by the physician in trying to get the bowels to

move beforehand. If I had known the condition I should have washed out the patient's stomach to get rid of the castor oil which had been given before the operation. The woman vomited all night and the next day. Before I saw her again she died, three days later, from paresis of the bowel and exhaustion from vomiting. At the autopsy there was no general peritonitis, but the peritonitis was confined to the region of the appendicial abscess, and the drains reached every part of it. I have had a fair number of extreme cases of appendicial abscess in which I have had to wipe out the pus, get the appendix out, and drain freely. As I have said, the bowels will move in these cases in three or four days if we let the patients alone. I am confident that physicians lose many lives in their endeavors to get the bowels to move with purgatives. Of course, washing out the lower bowel does not do any harm, but will frequently help it. In giving a purgative immediately after operation in inflammatory cases, it is a question of the extent of the local paralysis how much harm we do. The distention of the bowels by gas should be controlled by a snug abdominal binder, while opium and starvation should be substituted for purgatives. Many patients die of regurgitant vomiting and distention who have not general peritonitis.

Dr. J. W. Long, of Salisbury, N. C.—I desire to place on record a case of ovarian cyst that I saw in a negro woman in this city five years ago. The cyst weighed twenty pounds. I removed the tumor at the Old Dominion Hospital, and the patient made a rapid recovery. The woman was very black and could not have had more than one-eighth white blood in her.

About three years ago a coal-black North Carolina negro woman who went by the name of Black Sally, and she was as black as the ace of spades, was referred to me for operation. She had a mass of five myomata in the uterus and quite a large ovarian cyst of the left ovary. In this instance I removed the uterus and adnexa. The woman made a perfect recovery.

Dr. Manning Simons, of Charleston, S. C.—Because of the remarks made by Dr. Long I arise to report a case of ovarian cyst in a negro. This cyst had been permitted to grow until the distention of the abdomen was enormous. The abdomen was so greatly distended that it looked as though it would burst. The cyst contained gallons of fluid. I operated upon her at the hospital. There were adhesions throughout; the wall of the cyst was so adherent to the abdominal wall that I could scarcely

find a reef in which to begin separation. The tumor had been growing and the distention going on for years. I believe it is the largest ovarian cyst I have ever seen.

Dr. Long.—Was she a coal-black woman?

Dr. Simons.—No, but a black negro.

Dr. Joseph Taber Johnson, of Washington, D. C.—There were a good many interesting points brought out in connection with the paper of Dr. Leigh, and I desire to refer to one in particular—namely, the difficulty which he had in removing a fibroid tumor from the side of the uterus, with oozing, and great difficulty in arresting the hemorrhage, which called for packing, and then there was more or less trouble in getting the packing out, etc. If I understood him correctly, it would seem as if it might possibly have been better to have treated that fibroid tumor the same as we do tumors in operations like myomectomy, in which we make simply a V-shaped incision, stitch it together, stop the hemorrhage, leave a clean surface without oozing or any trouble afterward. I wondered why the doctor did not do that.

Dr. F. W. McRae, of Atlanta, Ga.—This question of moving the bowels after abdominal operations is one of the most important that can come before us, and I would like to discuss it at some length did time permit. I wish to say a word or two in corroboration of what Dr. Hardon has said regarding the value of alum enema. We in Atlanta have learned to value it as one of our best remedies, and it often saves us the necessity of giving purgatives to patients that are nauseated.

Dr. Johnson.—How do you explain the fact, Dr. Hardon, that alum is such an astringent and is used for its astringency in many cases, especially in the vagina? Practitioners give vaginal injections of alum for the purpose of relieving all sorts of discharges from the vagina, drying them up, etc., and how is it that it produces such different action in the rectum from what it does in the vagina?

Dr. Hardon.—Perhaps I cannot explain that satisfactorily, but it occurred to me that it would act in the rectum like it does in the stomach, and it was that which first led me to use it. It produces peristaltic action, and it not only excites peristaltic action of the large intestine, but of the small one, too. The alum enema thrown up into the rectum, not going above the sigmoid flexure, will not only cause rapid and immediate expulsion of gas from the large intestine, but it will excite peristaltic action through-

out the whole intestinal tract, and save the lives of patients who have paralysis of the bowels who otherwise would die.

Dr. McRae.—In connection with the remarks just made by Dr. Hardon I have had an unfortunate result in one case which confirms the statement he made regarding violent peristalsis. I had a case of strangulated hernia involving the large bowel. On the second day an alum enema was given, and peristalsis was so great that perforation of the bowel occurred. Of course, it might have occurred without the alum enema.

Dr. George Ben Johnston, of Richmond, Va.—Some time ago Dr. Stone, of Washington, D. C., wrote to a number of men throughout the South for reports of cases of ovarian tumor in negro women, and later Dr. Royster made the same request. I gave Dr. Royster a list of three cases of ovarian tumor in negro women, and since that time I have seen three other cases. Singularly enough, two of the cases had twisted pedicles. The last case I operated on was in May. The woman was almost jet black; the ovarian tumor was one of the largest ones I have ever seen. The fluid which was caught at the time of puncture and the sac, with some fluid which was wasted, weighed one hundred pounds. It was a gigantic tumor. I have a photograph of this case taken in a number of attitudes.

With reference to alum enema, I desire to express my profound gratitude to Dr. Hardon for a reprint by him on this subject which he sent me some time ago. I confess that I approached the remedy with some degree of doubt. I did not use it until I had tried everything else known to me and to my assistant, who is skilled in the post-operative management of cases, and when we had exhausted all the common means known to us we resorted to alum enema with the most happy results. Now we do not feel any great tribulation over the question of getting a patient's bowels to move. If we fail with any of the common remedies we simply order an alum enema. I am convinced it has been the means of saving several lives in my hands.

Dr. W. E. B. Davis, of Birmingham, Ala.—I would like to ask Dr. Hardon when he began to use alum enema.

Dr. Hardon.—It was early in 1892 that I first began the use of the alum enema, and I have continued to use it ever since, and at various times I have referred to it in meetings, but it has never seemed to attract much attention. It has not been adopted except in my own immediate vicinity, where practitioners have

become conversant with its effects as shown by my use of it. It is becoming generally used in Atlanta in medical as well as in surgical cases. It has been used in cases of typhoid fever, for instance, when it is desirable to secure rapid and certain action of the bowels.

Dr. Davis.—I would like to ask Dr. Hardon how he first came to use this remedy.

Dr. Hardon.—Something over nine years ago, on April 21, 1892, I operated on a patient for pyosalpinx, removing the appendages on both sides. The operation presented no unusual complications. There followed the ordinary ether nausea, but instead of subsiding in a few hours, as it commonly does, it continued through the next day. At the end of twenty-four hours there was evident distention of the bowels by gas. The temperature, which up to that time had remained below 100°, rose to 102°. The pulse ran up to 130, and began to be thready in character. I recognized the necessity for prompt action, and prescribed Epsom salts, which was not retained. Calomel in half-grain doses every hour was also rejected by the stomach. Enemata of soap and water, castor oil, glycerin, turpentine, and ox-gall were successfully used, but without avail. A rectal-tube was passed high up into the colon, but no gas escaped through it. At the end of the second twenty-four hours the patient's condition was alarming, and, from my previous experience with intestinal paresis, I felt that the case was practically hopeless. In casting about in my mind for some means of relief, it occurred to me that by analogy with the violent gastric peristalsis effected by alum when taken into the stomach, a similar effect might follow its injection into the bowel. I, therefore, directed the nurse to prepare a solution of an ounce of powdered alum in a quart of warm water, and to inject it into the rectum while I sat by and awaited the result. In about ten minutes I was rewarded by hearing the sound—so grateful to the ears of the abdominal surgeon—of flatus escaping from the rectum. A large volume of gas was expelled, and the patient was correspondingly relieved. In an hour the enema was repeated with a similar result. From that time on the gas was expelled at intervals spontaneously, the pulse increased in strength and diminished in frequency, the temperature fell rapidly until it was below 100°. The patient was practically convalescent on the following day, made a rapid recovery, and left her bed at the end of two weeks.

Since that time I have used the alum enema in hundreds of cases, and always with equally good results. I have not varied from the formula which I used in the first instance; but one of my assistants on one occasion, misunderstanding my directions, used an enema of one-half that strength, with apparently as good results. But as no bad effects follow the use of the stronger solution, I still use an ounce of powdered alum to a quart of warm water, which is approximately a 3 per cent. solution. Sometimes it is necessary to repeat the injection before it will act. This can be done with perfect safety an indefinite number of times. There may be reaccumulation of gas after the first enema has done its work. If so, the injection may be repeated as often as the gas accumulates. There is sometimes some pain attending its use, but it is not severe. It is not necessary that the solution should be carried high up in the colon. I inject it in the same manner that I would an ordinary enema, and probably in no instance does it go above the sigmoid flexure. But peristalsis is induced throughout the whole intestinal tract, including the small as well as the large intestine. In a certain proportion of cases in which the alum enema has been repeated several times, there is thrown off from the bowel a tubular cast, but microscopic examination has shown that this cast is composed simply of mucus whose albuminous elements have been coagulated by the alum.

Dr. Leigh (closing the discussion).—In answer to the question of Dr. Johnson, I will say that the patient's condition was so desperate that I could not wait to stop the oozing from the stitch-hole; I put in a small piece of iodoform gauze packing, had some difficulty in taking the packing out, which did not interfere with the healing of the abdominal incision. The woman was a poor negress, and had no white blood in her, so far as I could tell. It was unquestionably an ovarian cyst. Dr. Hardon imagined that it might not have been an ovarian cyst.

Dr. Hardon.—I do not wish to be understood as casting any doubt on the diagnosis of Dr. Leigh.

Dr. Leigh.—The walls of the cyst were composed of ovarian tissue, or very largely so.

I did not mean to lay down absolute rules regarding the movement of the bowels of these patients. I simply wanted to enter a protest against the rule that has existed for so many years among gynecologists—namely, using salts of calomel and

other salts for the purpose of producing movement of the bowels. I have seen it done in hundreds of cases by the best gynecologists, and I have often thought something better could be used, some other remedy which is easier to swallow and does not taste as bad. My attention was drawn to the remedy I have mentioned in this way: One of my colleagues, who had not had any special experience in abdominal surgery, some years ago had a case in which I assisted him, and he paid no attention to the bowels for three or four days. I felt alarmed, and I thought the patient was going to have obstruction of the bowels. He gave a teaspoonful of compound licorice powder, and it worked like a charm. The reason I suggested pills is because they are so small that you can give them to patients with anything that they may take. I give one pill, repeat it every hour for a few days, and since I have been using this method, which I do not claim is original, I have had much less trouble in moving the bowels. There are some cases in which salts are indicated, as in peritonitis. But I must enter my protest against the indiscriminate use of calomel salts in these cases. I have seen two or three cases in which the patients seemed to have had paresis of the intestines following abdominal operations, and in which I obtained apparently beautiful effects from the application of the faradic current to the abdomen. I know of some other cases in which that has been used. I thought my results were sufficiently good to warrant me in mentioning this before the society. I have no doubt some of you have used it. I take an ordinary faradic battery, apply one pole to the anus and the other pole to the different parts of the abdomen where we can get with it, without interfering or troubling the patient very much. The applications are repeated every few hours, and enemas are used at the same time.

TWO CASES OF ANALGESIA FROM THE SPINAL INJECTION OF COCAINE.

By Felix A. Larue, M.D.,
New Orleans, La.

I desire to present to you to-day the notes of two cases that I operated on this summer, under spinal analgesia, after the subarachnoid injection of cocaine.

Although my quota of cases is a paltry contribution, the great importance of the subject has prompted me, as it should all who have attempted this measure, to report in detail the clinical facts.

As this method has and is still occupying the surgical mind, I think it yet opportune to record each case, so that, in the grand compilation of that special work throughout the world, the good and bad features of the method, its indications and contraindications, may be definitely outlined. I frankly confess that when I witnessed Dr. Tuffier, in 1900, operate on some of his cases in Paris I was again elated on the immediate good results of this method. I was present when Prof. Rudolph Matas, in November, 1899, at the New Orleans Charity Hospital, first attempted to produce analgesia by the spinal injection of cocaine. It was for a simple case of hemorrhoidal ligation in a highly sensitive colored male, and with an ideal result.

This case was also the first in the United States to be operated on by this method with cocaine. Dr. Matas had a few days previously succeeded in entering the canal, and had even injected a solution of eucaine, but without any result.

I had, however, never seen any laparotomies performed before I witnessed Tuffier do his abdominal hysterectomies under spinal cocainization. We all know how Tuffier still proclaims, as often as he can, his wonderful results, with no direct mortality, at least in his own opinion.

I must say that he seems to scrupulously analyze the cases in which deaths could be and have been by others imputed to the injection of cocaine. We have all read of the sad results in the hands of other operators, but I am inclined to believe that in most, if not in all cases, death was due to other causes.

Take, for instance, the thirty-six cases recently reported by Villars at the French Surgical Congress, among which he had three deaths on the day of operation. Analyzing these cases, we find one of intestinal obstruction, another a case of pelvic fracture, with very serious complications, and, finally, a case when the patient was moribund at the time of operation.

I will also cite the case reported by Broca, of a patient who, in the hands of another surgeon, was operated on under spinal analgesia for some trivial trouble, and who was, against the rules laid down for this method, allowed to get up immediately after and walk quite a distance, death suddenly resulting. Now, can this fatal ending be really attributed to the injection method?

I, for my part, cannot incriminate solely the cocaine injection, but rather fear that there was a rash and unwise step in the post-operative management of the case.

I do not wish to be understood as saying that death is impossible from this method, but what I do believe is that if we rigidly follow the pre-operative and post-operative rules set down for this method we will, if not entirely remove all chance of a fatal result, we would undoubtedly reduce it to a minimum.

I cannot say that I have as yet read of a case in which death could undeniably be imputed to the method or to cocaine. In this connection I may mention the latest change brought

by Guinard to the technique, which consists in using as the vehicle for the cocaine the spinal fluid itself instead of sterilized water. Guinard asserts that all the bad symptoms occurring after spinal cocainization were produced by him by simply injecting sterilized water in the subarachnoid space. Since he has adopted his above-mentioned modification he avers that he has not met with any of the well-known accidents, such as cephalalgia, pyrexia, nausea, and vomiting.

Tuffier has followed Guinard's suggestion, dropping into the syringe before the puncture a few minims of a highly concentrated cocaine solution.

But besides the question of mortality, which is of prime importance, we are all well aware of the very troublesome and at times alarming symptoms which have followed the spinal injection method.

Tuffier remarked that those symptoms were more frequent when the spinal fluid escaped *en bavant—i. e.*, like slowly dribbling saliva.

In the two cases that I will report quite the reverse occurred. Both cases were prepared as for general anæsthesia, which should be the rule, excepting naturally in cases of emergency. All organs were examined. The urine was found normal.

The first case that I will relate was one which certainly called for spinal injection, as his local and general condition was wretched at the time of operation. The needle was introduced in my two cases between the third and fourth lumbar vertebræ without the least difficulty. Needless to say that all aseptic precautions were rigorously taken.

Case I.—J. L., white, male, aged fifty-four years, laborer and non-alcoholic, was admitted into Ward 7 of the Charity Hospital on May 10, 1901. The patient was suffering from a compound fracture of both bones of the left leg, having been run over by a wagon. The leg at the time of fracture was the seat of an extensive chronic ulcer of fifteen years' duration.

The limb had to be carefully laid in a fracture-box, with antiseptic dressings, which, however, did not prevent suppu-

ration and gangrene from developing at the site of fracture. I had a suitable tin trough made in which the patient could, while in bed, have the injured parts immersed, and by means of two holes in the improvised tub, water was allowed at times to flow from above downward without wetting the bed. The upper opening in the trough was connected with a rubber tubing, through which flowed from an irrigator a very hot carbolized solution. The tube attached to the lower hole carried off the water into a bucket. These precautions proved so valuable that the local and constitutional symptoms were held in abeyance, checking, I am convinced, an imminent septicæmia.

We, however, urged the patient to have his leg removed from the start, warning him of the great risks he incurred in the conservative treatment. He refused our advice until May 22d, twelve days after his entrance, when he consented to part with the unsightly and foul-smelling mass.

On May 22d, as the chart indicates, he was operated on under spinal analgesia, 10 minims of a 2 per cent. solution of cocaine being injected—an ideal case for the spinal method, and, as the chart demonstrates, with a result free from any disturbance.

The operation began at 10.36 A.M. Pulse, 90; temperature, 98.2° F.; 2 minims of clear spinal fluid not under tension flowed in a few seconds. Cocaine injection completed at 10.39 A.M.

The solution of cocaine in plain sterile water was, for further precautionary measure, brought five times to the boiling-point in a test-tube. At 10.45 A.M. the limbs felt benumbed; 10.51 A.M. slight excitement; pulse 120. The elevation and simple tourniquet hæmostatic method was applied. Began cutting at 11.03 A.M., performing a circular with an external slit operation. At 11.13 A.M. pulse 110; limb is off at 11.15 A.M. Pulse 112, slightly irregular; patient cold nearly to shoulders, with perspiration. Although atropine, strychnine, and brandy were then administered, I considered the medication more as a prophylactic measure against shock

than for apparent bad condition of the patient, who maintained that he felt all right. After applying clamps and ligating the bloodvessels the constrictor was removed at 11.32 A.M.

The stump was closed with catgut and silkworm sutures without any pain until 12.05 P.M., when sensation returned as the last suture was being passed through. The pulse, which is marked as irregular and intermittent on the chart, was such also before the operation.

I wish to state here that I was very favorably impressed with the Z. O. plaster used to close some small gaps in the line of incision, causing no irritation whatever of the skin.

CASE II.—P. S., aged twenty-six years; non-alcoholic; admitted into Ward 7 of the Charity Hospital April 5, 1901, for an extensive machine injury of the left thigh and leg, received while working in a lumber mill. In healing a large ulcerative surface remained, to which I applied some Thiersch grafts on May 31st under spinal analgesia.

At this juncture I will admit that this was not really a case in which the spinal method was absolutely indicated; but I thought that I would try it, and in case of satisfactory analgesia the patient would, as he in fact did, assist me materially by turning himself and leg as I would direct, facilitating thereby the excision and accurate adjustment of the grafts. These were taken from the opposite thigh.

I certainly do not believe the spinal method should be made a routine practice, but it no doubt has its indications. We can formulate this general rule: that whenever there is any contraindication to a general anæsthetic, and that local anæsthesia cannot be applied, the spinal method should be resorted to. I know of one unfortunate, a non-alcoholic, who is troubled with a syphilitic rectal stricture which has to be dilated from time to time. This intervention has been effected several times under chloroform, with great ease to the operator and patient, with not the least post-anæsthetic malaise. This same patient once underwent the dilatation of his stricture under spinal analgesia, without the slightest pain

during the operation. He nevertheless presented in a marked degree such sequelæ as nausea, vomiting, intense headache, and fever.

As you will notice from the chart of Case II., my patient was also a victim of the same symptoms, although during the operation analgesia was complete and the spinal fluid appeared to flow from the canal under tension.

Cocaine injected at 11.02 A. M. Loss of pain in sticking left foot with a pin after three and one-half minutes. Loss of pain in five minutes in right foot and both legs. Pulse, 128. Face red; nervous tremor of right leg; patient a little excited.

A hypodermic injection of a quarter of a grain of morphine, which should have been given as a preliminary to the cocaine, was administered eleven minutes after spinal injection.

First graft removed from right thigh at 11.20 A.M., without pain. Pulse, 120; respiration, 28. Second graft, same length as former (2½ inches). Pulse, 120; patient feeling quite well. Third graft, about the same length, removed 11.24 A.M. The first graft, removed from the warm saline solution, was applied at 11.25 A.M. Pulse, 126; respiration, 28; pupils normal. The second and third grafts were rapidly applied.

Patient perspired a great deal during the operation, with at times a nervous tremor of the other leg.

The fourth graft was taken off at 11.30 A.M., without pain, patient feeling, however, a sensation of rubbing. Vomiting then occurred, lasting one and a half minutes. Pulse, 100; respiration, 28.

At 11.35 A.M. fifth graft removed. No pain, but felt rubbing of razor more than for the fourth.

At 11.38 A.M. sixth one taken off. No pain; movement of razor still more accentuated; in fact, patient felt no pain until 11. 46 A.M., when the ninth graft was removed with very little pain. One minute later the tenth and last graft was excised, producing a little more pain. The tongue was always moist during the operation, patient stating himself that he felt very well, excepting slightly nervous.

Duration of entire operation, forty-seven minutes.

REPORT OF A CASE OF RECTAL PROLAPSE OF MANY YEARS' STANDING

SUCCESSFULLY OPERATED ON BY INTRA-ABDOMINAL TRACTION AND FIXATION TO INTERNAL OBLIQUE AND TRANSVERSALIS MUSCLES, THE ANALGESIA BEING BY INTRASPINAL INJECTION OF ONE-FIFTH GRAIN COCAINE MURIATE.

By F. W. Parham, M.D.,
New Orleans, La.

S. M., male, white, aged forty-three years, was admitted to my service in Charity Hospital on July 20, 1901, suffering from rectal prolapse. Patient, a man in good health, said he had had the trouble ever since he could remember. It came down with every evacuation and evidently included all coats of the rectum. In the squatting posture he could reproduce the tumor at will, and, what is more remarkable, he could also, by negative pressure, by suction, as it were, again draw it completely back. It was much thickened and irritated from its frequent descent, and was a source of great annoyance and discomfort to him. I determined to relieve him by some radical procedure. For these large prolapses two methods attracted my attention, excision or amputation and traction from above.

An admirable method of carrying out the first is that described by George Ryerson Fowler in the *Medical News*, December 8, 1900, where he relates a successful operation in a very aggravated case. The procedure possesses some decided advantages over other methods and presents some unique features. I decided, however, to adopt the second plan, being

perhaps influenced somewhat by the observation of my patient's ability to draw it up by voluntary effort.

I carried out essentially the plan advocated by Matthews, of Louisville, as reported in the *Journal of the American Medical Association* of March 30, 1901. For obvious reasons I adopted the suggestion made by Fowler and carried out in his case of excision just referred to, that is, analgesia by spinal cocainization.

The operation was as follows:

Operation, July 27, 1901. 10.05 A.M., needle inserted in fourth space, three drops of spinal fluid lost; 10.07 A.M., × 2 per cent. solution cocaine introduced; 10.09 A.M., needle out; 10.14 A.M., analgesia nearly complete; 10.17 A.M., complete to level of umbilicus.

Operation begun.

10.19 A.M., nausea and vomiting, relaxation of anal sphincter; pulse weak and infrequent; 11.05 A.M., operation completed, with entire absence of pain; 11.15 A.M., anæsthesia persisting, even arms and scalp being markedly affected. Hyoscine hydrobromate $\frac{1}{100}$ gr., strychnine sulphate $\frac{1}{20}$ gr. during operation.

The operation was McBurney's gridiron incision, the muscular layers being separated in the direction of their fibres rather than cut. The sigmoid having been identified and brought out, a silkworm loop was put in and the bowel dropped. The patient was then told to force out the prolapse by a voluntary effort. This he easily did, the anal sphincter being well relaxed by the intraspinal injection of cocaine. The silkworm loop was now caught up, the sigmoid again brought out and the bowel forcibly drawn upon until an assistant, watching the anus, informed me that the prolapse had disappeared into the pelvis. The needle carrying the kangaroo tendon was passed under the anterior longitudinal band, that is, between the sigmoid surface and the band, and brought out; thence carried obliquely across, it was again passed under the band in the same manner. There were now two free ends of the suture—one on each side of the band.

Each end was threaded on a needle and passed straight through the peritoneum, transversalis, and internal oblique muscles. The sigmoid was now suspended by the kangaroo tendon, and it was easily drawn up into proper contact with the wall by pulling on the two ends of the suture, assisted by a finger in the peritoneal cavity gently holding up the sigmoid. The sigmoid was fixed in place by the tying of the suture. This brought together at the same time the separated fibres of the internal oblique and transversalis muscles, so that one more suture external to this closed these layers very accurately. It will be observed that when the two ends of the kangaroo tendon were tied on the external surface of the internal oblique, it made, with the part suspending the sigmoid, a complete figure 8. The aponeurosis of the external oblique was brought together by a continuous kangaroo tendon suture. The skin was united by interrupted silkworm-gut sutures.

On the completion of the operation $\frac{1}{4}$ grain morphine sulphate was given hypodermically, and subsequently ten drops of laudanum by mouth every four hours, to inhibit peristalsis. The foot of the bed was kept elevated. August 9th, skin sutures removed. August 17th, discharged well, defecation being normal and entirely painless. Have not been able to get any report from him since that date.

I think the internal oblique and transversalis a better point of traction than the rectus as carried out by Noble, of Philadelphia (see Matthews' article, op. cit.). The whole procedure is extremely simple, very striking, and the results effective. I believe analgesia without loss of consciousness of decided advantage, as demonstrated in this case.

For references to literature see article of Matthews cited.

[NOTE.—After the above had gone to the printer, a letter from the patient, dated March 4, 1902, stated that after an unusual looseness of the bowels there was a tendency to recurrence of the prolapse, but he was able to keep it up without difficulty. This tendency will probably be overcome in time.]

HEPATIC DRAINAGE.

By John B. Deaver, M.D.,
Philadelphia, Pa.

The future status of any of the various divisions of the science of surgery is practically impossible to foretell, yet it is not thought a rash prediction that there is no part of general surgery that will receive more attention in the next few years and see more advancement than the surgery of the gall-bladder.

The surgery of the gall-bladder and the bile-ducts is still in the stage of development, in spite of the able and valuable work that has been done on this subject by Hans Kehr, Mayo Robson, Richardson, Murphy, and many others.

Both the diagnosis and treatment of these conditions are still cloudy, and there is much work to be done, which will be amply repaid before this subject is brought into the full sunlight of clear understanding. The diagnosis, in many respects, is still far from clear. What the work of the future will reveal is a method of early diagnosis that will enable us to recognize the very beginning of the pathological processes in this region, in order that a careful watch may be kept on its advancement and surgical interference instituted at that time which logic and surgical experience shall indicate as the best.

Diseases of the gall-bladder and ducts occur with remarkable frequency. The best observers have said that in 9 per cent. of the human race gallstones are present, and if we add to that the large number of cases in which there is gall-bladder disease without stones we can see how large a percentage of

our patients must have imperfect gall-bladders. However, since the overwhelming majority of these cases remain apparently latent and innocuous, the proper course to pursue is very puzzling.

Gall-bladder disease is markedly protean in its character, perhaps even more so than appendicitis, and the wide variance in its seriousness calls for the closest study and the greatest care in classification. In its pathology, too, gall-bladder disease closely follows the pathology of appendicitis. The same changes take place, step by step; and in both, at any stage, there is always the ever-present danger of an acute exacerbation that will in a few hours place the patient beyond medical or surgical aid.

The first step in the progressive pathological condition is usually catarrhal inflammation, due to the irritation of stones or infection of the bile; then an interstitial inflammation and a pericholecystitis follows, resulting in an adhesive local peritonitis, causing adhesions between the gall-bladder and the neighboring viscera. Finally, contraction of the gall-bladder, making traction on the adherent viscera and causing obstruction of the bile-ducts, partial obstruction of the duodenum or the transverse colon, and a host of other symptoms in which the part played etiologically by the gall-bladder is often entirely overlooked. Hand-in-hand with these changes go the effects of extension of the inflammation along the interior of the bile-ducts, obstruction of the bile stream through inflammatory tumefaction of the ducts, and the grave results of cholangitis and pancreatic inflammation.

Going back to the similarity of gall-bladder inflammation and appendicitis, the stones play the same part as the fecal concretions—causing ulceration and strictures of the ducts.

The progress of gall-bladder disease is not usually, we believe, a steady, onward march, but a succession of exacerbations and periods of latency. The fact, however, must not be overlooked that the individual exacerbations may be so slight that the disease is not even suspected until the advanced stages are reached.

It were well if all cases of gall-bladder disease had this slow progression; but, unfortunately, at any stage a sudden crisis may develop of the utmost gravity, through an acute gangrenous cholecystitis, a pericholecystic abscess, or perforative peritonitis, again reminding us of the pathology of appendicitis.

Perhaps as useful a classification of the symptoms of chronic cholecystitis as any is the division of the symptoms into three groups:

First, those caused by the presence of stones and extension of the inflammation along the interior of the ducts; second, the symptoms due to the pericholecystitis; and third, the symptoms of cholangitis.

This classification is to a great extent arbitrary, and all its divisions are blended in a broad pathological picture; but their separation is useful in our efforts to determine the stage reached in the disease and the exact lesion present.

The stones, if they remain in the gall-bladder, are practically innocuous, and are rather the result of the inflammation than the cause; or perhaps they may better be considered as going hand-in-hand with the disease, sometimes preceding, sometimes following, the inflammation. Their presence in the ducts is a more serious affair, as here they furnish the nidus for strictures, and by their bulk aid in the obstruction of the bile current. Practically all modern writers have abandoned the theory of mechanical obstruction due to the wandering of a stone for the more reasonable one of inflammatory tumefaction, which explains the conditions found at the autopsy and the operating-table in a much more satisfactory manner.

The symptoms caused by a catarrhal inflammation of the gall-bladder and ducts vary widely in different cases. In some, where the consequent swelling of the mucosa is not sufficient to seriously impede the flow of bile, the only symptoms are a slight enlargement of the gall-bladder, with a little tenderness in that region, a slight elevation of temperature, and a very moderate feeling of malaise and anorexia.

In many cases the occurrence of these mild attacks are the only indication of a gall-bladder disease that is progressing steadily, and when operated upon on account of an acute exacerbation or intercurrent disease we are surprised to find a condition of the gall-bladder much more advanced than the duration or severity of the symptoms had led us to believe.

In other of the catarrhal cases only a little more severe grade of inflammation will produce the most alarming symptoms. The lumen of the cystic duct may be obstructed and severe gallstone colic occasioned; the inflammation may obstruct the common or hepatic duct and a marked grade of jaundice develop, and yet the causative pathological process be in reality but little more severe than in a case of mere "biliousness."

The symptoms of pericholecystitis are most confusing and difficult of diagnosis, adhesions to the duodenum, often in the subsequent contractions so obstructing its lumen that a dilatation of the stomach results. Adhesions to the transverse colon or other part of the intestines may cause symptoms of intestinal indigestion, and adhesions to the stomach may very closely simulate gastric ulcer.

If in cases with these complications the individual acute exacerbations of inflammation have not been marked, it is only with the greatest acumen that we can arrive at the true nature of the trouble.

There is no doubt that a large percentage of the cases of chronic dyspepsia and intestinal indigestion are caused by the adhesions of cholecystitis and appendicitis, and no chronic case of this nature should be passed without a careful consideration of these two conditions.

Of the chronic symptoms of gall-bladder disease none are more serious than cholangitis. The obstruction of the bile-ducts by an infectious inflammation permits of a spread of the infection up the smaller ducts of the liver, and produces a marked cachexia and a very serious form of hæmatogenous jaundice as well as the other manifestations of hepatic infection.

Gall-bladder disease is a progressive process, with very little tendency to self-limitation. There are perhaps a few cases of spontaneous cure by the discharge of all the stones and a subsidence of the inflammation; but in these cases, if there has been a pericholecystitis, with adhesions to the surrounding viscera, symptoms due to these adhesions will persist without even the slightest sign of gall-bladder disease. This point is very important in the causation of dilated stomach and other intestinal troubles, and, as said before, should never be lost sight of.

The progress of gall-bladder disease is, however, remarkably slow in many instances. An individual may have a slowly progressing gall-bladder disease extending over the course of his whole life, which never at any time causes more than a few days' indisposition at irregular and often widely separated intervals; yet in other cases a few days, or even hours, may be sufficient to terminate his life.

Gallstone disease was formerly divided into the infectious cases and those in which the symptoms were caused by the mechanical action of the stone. This classification is not correct, to our minds, for we believe that all the cases are infectious in their nature. Not that a gall-bladder once infected always remains so, but that each exacerbation is due to an infection which even the slightest enteritis is sufficient to light up in the already damaged gall-bladder.

Again returning to our analogy between gallstone disease and appendicitis, we can divide the symptoms into those which are occasioned by pericholecystitis and those caused by defective drainage. The symptoms of pericholecystitis are those occasioned by the adhesions in great measure, and freeing the adhesion will relieve them, but the prevention of their reappearance lies with their cause—the defective drainage of the gall-bladder and liver; so, no matter what the nature of the symptoms, their cure lies in securing free hepatic and cystic drainage.

The flow of bile is so free that unless this is interfered with the serious infection of the gall-bladder, or more par-

ticularly the liver, is hard to conceive; therefore our success in the treatment of gallstone disease depends upon our ability to establish and maintain free drainage.

The waters of the Sprudel Spring at Carlsbad have long had an enviable reputation for the cure of gall-bladder troubles, but we believe that no medicinal water is able to restore a damaged gall-bladder to normal. What is accomplished is the freeing from infection of the hepatic drains, and by thus reducing inflammatory tumefaction to make room enough for the establishment of free drainage; yet the pathological lesions are still present and ready at the slightest infection to again show themselves as a continual menace to life.

If we are able to diagnose gall-bladder disease in its earliest stages before any marked anatomical changes have occurred, then temporizing and Carlsbad are indicated; but if the case first comes to our notice in the late stages, when adhesion, contraction, and strictures have made groundless the hope that nature will restore to normal the drainage system of the liver, then temporizing is dangerous. The mortality of operations for gallstones lies not to the charge of the operation, but to the time at which it is done.

Any operation performed upon a patient suffering from severe jaundice and an infective cholangitis is sure to have a high mortality, and the only way to avoid this is to operate early, before the patient has developed these conditions.

Gall-bladder surgery ought not to be relegated to a "last resort" procedure, but should be done at the time when the chances of recovery are the best. The "last resort" surgery in all departments is the cause of the majority of unsuccessful operations. The wide-spread conviction that a surgeon is to be called in as a last resort is a great detriment both to the science of surgery and to the patient. How many deaths from appendicitis, cancer, sarcoma, gallstone disease, and many other conditions are due to this relegation of the surgeon to the rôle of a "last resort!"

In an operation for gall-bladder disease, if there is any

marked change in the gall-bladder, it is perhaps better to remove it. This applies especially to the cases operated upon early in the disease, for this procedure best insures a freedom from this trouble in the future, and adds very little to the gravity of the operation.

The gall-bladder is an organ of very little function in the human race. This is proved both by the result of its removal and by the cases in which stones have completely filled it, yet without symptoms.

The day is not yet, but we believe that experience will in the future show us that the removal of the gall-bladder is nearly as necessary an adjunct to the operation for gall-stones as is the removal of the appendix in appendicitis.

In the early cases removal of the gall-bladder does not render the operation more formidable, but less so, for it prevents many an embarrassing case of biliary fistula and assures us that we have removed the seat of the beginning of nearly all cases of defective hepatic drainage.

In advanced cases with cholangitis it is essential to freely open and drain the bile-ducts, for in the free escape of the infected bile lies our only hope for the cure of the condition. Then, too, gallstones are often met with in the ducts, and a complete operation cannot be done without their removal.

CARCINOMA OF THE FEMALE URETHRA; REPORT OF CASES.

By C. Jeff. Miller, M.D.,
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Carcinoma of the female urethra, while a very rare condition, is extremely interesting to the surgeon just now when the various methods for attacking malignant growths of the pelvic structures are being enlarged and improved.

Apart from the indications to remove early all cancerous tissues, there seem special reasons for interference in these cases, even though hopelessly advanced; for among the first and most serious complications to develop is obstruction to the flow of urine, with all of its train of painful and dangerous results, which, if not relieved, hastens death by adding double misery.

It is difficult to understand why cancer so rarely attacks the urethra. Skene states that primary cancer is greatly doubted by some good authorities, though it undoubtedly occurs. The urethra, presenting as it does the conditions generally supposed to predispose to malignancy, seems well protected, even from secondary invasions, the patient usually dying before the structures become seriously involved.

In 7479 cases of cancer Winckel found the vulva affected in 10 per cent., and Gurl in 11,131 cases saw only 66 instances of bladder involvement. This shows that cancer involving the urinary apparatus is quite rare, and Jewett and Polak state that cancer of the urethra is less frequent in the female than in the male.

The variety of cancer most usually present is of the squamous type. Sarcoma is seldom met with. Howard Kelly states that only 4 cases are recorded, 3 of which occurred in women over fifty years of age. This is contrary to the statement that sarcoma should be suspected in early life and not confounded with fibroma, which is nearly always met with in the young. One of these cases is reported by C. A. L. Reed as melanosarcoma, the first and only case of its type on record.

Since the first description of malignancy involving the urethra, two forms have been described: either primary cancer involving from the outset the walls of the urethra, or a periurethral or secondary form, spreading from neighboring tissues and showing a predilection for the connective tissues around the canal. Skene states that Winckel divided the forms into three grades, viz.: first, when but one-half the length and depth of the urethra is invaded by tubercles; second, when the vesical neck and pelvic fascia are attacked; and thirdly, when the pubic symphysis, descending pelvic rami, and the closely blended tissues are involved.

The primary form has its origin in the epithelial structures and glands along the floor of the urethra, where it develops, either as pedunculated, warty, or papillomatous growths, or, as Reed describes, ulcerated surfaces with thickened, irregular, and infiltrated edges.

The periurethral form originates in the epithelial structures of the vestibule, close about the urethra, and spreads in the cellular tissue around the canal, without involving the urethral walls or mucous lining. Kynoch states that it is prone to spread spirally around the urethra, thus departing from the ordinary tendency of vulva carcinoma to spread superficially to adjunct structures, the urethra being seldom involved. In most of such cases the urethra is converted into a small, rigid tube, which bleeds freely when manipulated, and almost invariably leads to incontinence of urine, or extreme difficulty in emptying the bladder. The most frequent symptom is incontinence, in fact, it may be the only

suggestion of disease present until sloughing of the tubercles commences. Then itching and irritation, together with acrid discharges, is noted. In one case reported with these remarks difficult urination existed for several weeks before the woman detected a tumor as large as a large blackberry at the meatus. Pain was not present until sloughing began.

The prognosis of such cases is necessarily very grave. Lymphatic infection is an early occurrence, and radical measures are necessarily limited to early cases, because of the important organs so soon involved. Kynoch states that carcinoma of the male urethra comes sooner under observation because of the earlier and greater difficulty of micturition and cystitis.

The treatment of such conditions has not been at all satisfactory. According to Kynoch, in Ehrendorfer's collection of twenty-seven cases only two were free from malignancy after an interval of three to six years.

The chief aim of the surgeon has been to operate before the sphincter muscle became involved and to remove the urethra together with its surrounding connective tissues. It is a matter of great satisfaction to know that the urethra can be entirely removed and the bladder still retain perfect sphincteric control. Dr. T. G. Thomas was among the first to report a case in which he showed the good effects of complete excision and the little disturbance that would follow. Complete removal of the urethra is even indicated in advanced cases, for it removes the necessity of catheterization made necessary by the increasing obstruction and the cystitis, which is always present, soon or late.

In the light of present operative advantages, bearing in mind the sad history of collected cases, complete excision of the urethra should not complete the surgical indications. Excision of the urethra, catheterization, or better the establishment of a vesicovaginal fistula to relieve the most disagreeable symptoms, should be placed in the same class, viz.: palliative. Nothing short of complete removal of the urethra and bladder neck seems to be indicated in early

cases. Senn contends that if the urethra is primarily affected the radical operation is indicated. It should be preceded by the formation of a suprapubic fistula, then the base of the bladder should be excised and the opening closed permanently. This has been successfully performed by Pawlik and Oviatt.

A. F. McGill has reported a case and described a technique which should be of value in studying this subject. He opened the abdomen by a transverse incision three inches long, half an inch above the pubes. A transverse incision was also made in the bladder and its edges sutured to the skin to prevent the bladder dropping out of the way. The patient was then put in the lithotomy position and the cancerous mass removed, while an assistant pushed it down into the vaginal opening by pressing above through the abdominal incision. The vaginal opening was closed and the abdominal incision left for drainage. A vesicovaginal fistula followed, though it closed in thirty-seven days.

The subsequent history of the case is not given beyond four months, so the real value of the operation cannot be estimated.

The results obtained by extirpation of the bladder for malignant disease, as recently reported by Dr. Matthew D. Mann, promptly suggests such a procedure in urethral cancer. The operation should be confined to cases of primary cancer, and the indications would be the stronger in the earliest stage of the disease. In periurethral cases the tendency to return would be too strong to justify such a radical course. The chances of ultimate recovery from the disease would be decidedly better than after the partial operation of Pawlik and McGill, and the inconvenience to the patient would be little more.

One unfortunate point would be that the urethra could not be utilized in making a receptacle of the vagina for the urine, as in the very satisfactory cases of Simon, Pawlik, Sims, and others, who operated for reasons other than cancer. After all, however, the operation is justifiable and

would be more strongly indicated in primary malignancy of the urethra than of the bladder, for it is nearly always in the bladder that the growth returns. As Mann states, the operation is followed by a fair rate of recovery, and the technique is as simple and complete as removal of any other organ. The mortality is high, as might be expected in any new operation and for such a serious disease; still the chances of saving life when the cases are seen early would justify such radical measures. Of eight cases in which the ureters were simply severed and drained into the vagina three died; a very fair showing considering the varied technique employed.

The following histories simply illustrate the varieties of the disease. Nothing in the way of radical treatment was undertaken, owing to their advanced state when recognized. In the case of sarcoma, which the pathologist first announced as fibroma, the operation proposed by Pawlik, or possibly removal of the entire bladder, might have given a very favorable result.

Case I.—*Primary carcinoma of the urethra.* A widow, aged fifty-two years, sought advice because of difficult urination, which had gradually increased for two months. She had only noticed a tumor about the size of a hickory-nut in the meatus the day before coming for relief, which, after being manipulated, bled freely.

Inspection of the parts revealed a nodular growth, reddish in appearance, which bled copiously when handled. The base of the growth was sessile and attached entirely within and upon the urethral floor. The condition was pronounced malignant and operation was advised, but the patient postponed operation for a month. The parts were then found more extensively diseased and the patient much reduced owing to cystitis which had developed. Considering the disease too far advanced for other than palliative treatment, the urethra was removed flush with the sphincter, and well beyond the involved structures. The parts healed kindly, and she had perfect control of the bladder.

She improved markedly for two and one-half months until the disease returned, involving the bladder. She died eight months after, having at the time a vesicovaginal fistula, which had been made to secure drainage.

CASE II.—*Periurethral carcinoma extending from labia majus.* This case occurred in a colored woman, aged thirty years. She applied for relief at the Charity Hospital gynecological service. When first seen the disease was circumscribed. Microscopical examination confirmed the clinical diagnosis, but the patient deferred operation. Two months later the disease had extended across upon the vestibule and around the urethra. Special preference was shown for the periurethral structures. Difficult urination developed, and a small catheter could hardly be passed. The urethra seemed to be a firm cord for an inch of its length. The labia was removed together with the clitoris, vestibular tissues, and the urethra. She left the hospital at the end of three weeks, and was lost sight of; the history is, therefore, incomplete.

CASE III.—*Sarcoma of the urethra.* I am indebted to Dr. Paul Michinard for the notes of this case. The woman came under his observation in October, 1898, suffering from difficult urination. She was aged fifty-five years, white, and the mother of several children. The urethra was dilated and a sessile tumor removed from its floor about half an inch back of the meatus. Malignancy was suspected and a specimen was examined by a pathologist, who pronounced the growth a fibroma. In May, 1899, he was recalled to relieve her of retention of urine. She had been quite well until that time, and had experienced no pain. Examination revealed a tumor on the site of the former growth which completely filled the urethra. The entire urethra, together with the neck of the bladder, was removed. The bladder walls were brought together and sewed around a small catheter. The parts healed kindly and the woman had fairly good control of the bladder unless the intervals between urination were too long. The same pathologist

reported the second specimen to be spindle-cell sarcoma. The growth returned in one year in the base of the bladder, and the woman died soon after.

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POTT'S DISEASE AND SOME OF ITS COMPLICATIONS.

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The subject of Pott's disease is such an extensive one that it is simply impossible to do it justice in a paper suitable in length for a society of this kind, but the attempt must be made that you may have something of a general idea of the subject, as you are not all specialists in orthopedic surgery; this society being composed of general surgeons, gynecologists and general practitioners. Hundreds of pages are consumed in writing of this subject in the large text-books on orthopedics. Papers on this subject for societies are always limited to one or two phases of the disease. The object of this paper will be to deal with some of the most important features of this formidable malady, with the hope that an interest may be aroused that many of the unfortunate victims of Pott's disease may be benefited to the extent of preventing or reducing to a minimum the dreadful deformity that is so characteristic, and saving many from an untimely grave.

The writer feels almost tempted to apologize for occupying the time of this Association in bringing before it such an old subject, for it was described by the ancients—Hippocrates, Galen, and others. Sir Percival Pott, in 1779, wrote such an accurate description of it that it has since been known by his name. The principle involved in the treatment to-day is exactly the same as was used by Ambrose Paré in 1579. From that time to the present scarcely a new idea has been

brought out aside from the material used. Surely no apology is needed if one will only consider for a minute the large number of "humpbacks" that are still seen, and that these deformities could have either been prevented or limited by the intelligent application of the technique of the principle of the treatment as introduced centuries ago. I have nothing new to present that is not known to the most of you, but I do claim to have a reasonable familiarity with this disease, and trust that I may be able to tell you how a fair amount of success may be obtained in the treatment.

Pott's disease is a tubercular osteitis, beginning primarily in the spongy bone of one or more of the vertebral bodies. The disease is a destructive osteitis in type, and does not differ from any other tubercular osteitis; but it should be borne in mind that there is a reparative process—*i. e.*, a formative osteitis going on in connection with the destructive process, and that it is in aiding this latter process in every possible way that one hopes to bring about a cure.

The first abnormal appearance noticeable to the naked eye in examining a section of diseased vertebra is a small, hyperæmic spot in some part of the spongy portion of the vertebral body. This spot increases in size and becomes redder as the process extends; finally the centre becomes opaque and grayish, while a zone of hyperæmia surrounds it. As the focus of tubercular osteitis extends the grayish spot enlarges, until finally cheesy degeneration takes place. At other times both caseation and degeneration into pus take place, and a localized bony abscess occurs, which may be encapsulated by an inflammatory membrane. This one recognizes as an effort of nature to wall off the diseased area from the healthy tissue surrounding. A microscopical examination will show a mass of tubercles in the rarefied spongy bone tissue, and tubercle bacilli will be found in the tubercles; hence the more scientific and proper name for this disease is "tubercular spondylitis."

This focus of caseous material may be absorbed, calcified, or, as most commonly happens, the osteitis may increase

until the whole of the vertebral body is destroyed; this process is often very rapid and extensive. As soon as the body of the vertebra is sufficiently destroyed to weaken it it crushes, causing the characteristic deformity, kyphosis.

Kyphosis is not a necessary condition in diagnosing Pott's disease; one should diagnose this malady long before there is any deformity present. It should be borne in mind that it is possible to have a very extensive spondylitis run its usual course, extending over years, and finally get well and never have any deformity of the spinal column. This is explained by the fact that the disease is confined to the anterior surface of the vertebræ, not involving the bodies sufficiently to cause them to crush. The process may be confined to the centre of the body; in such a case little or no deformity will result. The subject of Pott's disease without deformity is barely alluded to in many of the text-books, hence I desire to call especial attention to it, for I believe it is much more common than is generally supposed, and many cases are never recognized, and many not until it is too late to help the unfortunate victims. This diseased process is, as a rule, limited to the bodies of the vertebræ; the transverse articular and spinous processes are only affected secondarily, so far as known; never primarily. Any part of the body may be affected; there may be two or more foci in one body, or the whole body may be affected. The abscess in the bone may extend, involving everything in front of it until several adjacent bodies are involved, which accounts for the extensive deformity seen in many cases.

Diagnosis. In a typical case of Pott's disease the diagnosis is easy, so characteristic are its symptoms. My remarks concerning the diagnosis will be confined to the symptoms when the disease is in its incipiency, long before there is any deformity of the spine. The most striking feature is the very guarded movement in walking, in stooping, or in lying down. The spine is most carefully guarded against motion and all sudden jar; the patient will walk on the balls of his feet, with knees and hips somewhat flexed, which produces

a springing gait. Constitutional disturbances are likely to be present when the disease is of a few months' duration.

The early diagnostic symptoms can be included under three heads: (1) Peculiarity of gait; (2) muscular stiffness, and (3) referred pain. All of these are present before the development of any deformity. The importance of these early symptoms cannot be overestimated, for in their recognition rests all of one's hope to bring about a speedy cure.

The peculiarity of gait may be due either to reflex muscular spasm or to an unconscious effort on the part of the patient to relieve jar or any increase of pressure upon the affected vertebral bodies. There is a disinclination on the part of the patient to carry his weight on his back; he will always lean on something. When he stoops he will always let himself down on his knees, to ease himself. If the disease is in the cervical region the patient will invariably support his head with his hand.

When the disease is in the lower cervical or upper dorsal region the chin is held somewhat raised, to balance the weight on the articular facets. The spinal column just below the seat of the disease will be abnormally straight or bent forward just a little, while lower down in the spine will be found a backward projection of the spinous processes, due to a compensating curve, which is so prominent at times that it almost suggests a second seat of the disease. When the disease is in the lumbar region the patient, in the early stages, will frequently lean backward like a pregnant woman or a man with a large abdomen. The patient is likely to walk a little one-sided, due to a contraction of the psoas and iliacus muscles; this feature is so marked at times that it almost suggests hip disease. This muscular stiffness is often more marked after a rest, especially after sleep, the stiffness diminishes after the patient moves about much. The peculiarity of attitude and gait will vary according to the severity of the disease. The amount of muscular stiffness, rigidity, and difficulty in maintaining the spine erect is to a certain extent an index to the activity of the disease. In the early

stages sometimes the erect or spinæ muscles will stand out in bold relief on bending the back, acting like physiological splints to the diseased spinal column.

The locality of pain, when present, is most important. The pain is rarely if ever in the incipient stage of the disease referred to the back, but to the peripheral ends of the affected nerves; it will be located in the abdomen, chest, or limbs, according to the part of the spinal column diseased. A persistently localized pain in a child should always arouse a suspicion and demand the closest attention.

The pain is usually subacute, but at times is so severe that the weight of the bedclothes cannot be borne. From the fact that the pain is subacute and that there is muscular rigidity often gives rise to mistaken diagnosis of rheumatism, sciatica, etc. It is impossible to go very deeply into the diagnosis in a paper of this sort. I have endeavored to point out a few of the cardinal features.

Prognosis. Pott's disease is a most formidable disease. Its long course, the severity of its symptoms, its terrible complications (abscess, paralysis, etc.); occasionally death coming on after years of suffering or terminating in dreadful deformity. That is the dark side of the picture. There are few affections that the orthopedic surgeon has to deal with that offer better results for his labors than does Pott's disease if he gets his patient in the incipiency of the disease and will use the best means of treatment and see that this treatment is properly carried out. Facts show that the disease tends to a spontaneous cure. What better evidence can we have that tubercular spondylitis is a curable disease? A natural cure may take place in two ways, (1) by absorption or calcification of the tubercular mass at an early or late stage of the disease; or (2) by the purulent degeneration of such tissue and its evacuation by an external opening. Suppuration seems to be nature's effort to eliminate the diseased material.

The prognosis of the case that devlops abscesses will depend upon the situation of the abscess, completeness of

evacuation, and amount of drainage possible. The prognosis is much more favorable in children than in adults; the latter are much more liable to the complications.

Prognosis as to time of recovery is very uncertain. Roughly speaking, three years is about the average time for the continuation of the treatment. Until one has seen a number of relapses it is hard to appreciate the importance of long-continued treatment. Perseverance and long-continued treatment are absolutely necessary to obtain good results.

Treatment. In considering the treatment of Pott's disease it is important to realize that you have to deal with a trouble that is not going to be cured in a short while; on the contrary, you are dealing with a malady that is going to demand the closest scrutiny, patience, and perseverance and attention to detail for several years, if you expect to get anything like a fair result. Not only is it an undertaking that is going to be very exacting of the surgeon, but will require the most hearty co-operation and the closest watching of someone who has the best interest of your little patient at heart. By far the most important factor in the treatment of a child with Pott's disease is discipline, and by this I mean absolute discipline not only in the management of the child, but its parents, nurse, in fact, everyone who has any authority over the child. These children, as a rule, are dreadfully spoiled, and for this reason one always gets the best results in his hospital cases. It is very important to obtain the confidence of the parents, and then you will have little trouble in securing their hearty co-operation if they have the best interest of their child at heart. My rule is always to explain to them exactly the principle involved in the treatment and what is aimed at, and then they will help you to execute it, for it is absolutely necessary to have someone in constant watch over the child. When the parents are willing to share the responsibility with you you will have plain sailing. I will not undertake to treat a case under any other conditions.

The results obtained from the proper management of these cases are most gratifying and well worth all of the trouble and worry you may be put to. I have seen cases with the most aggravated symptoms and the distressing complications not only cured of the caries, but recover with little deformity. I conscientiously believe that the large majority of cases that are able to resist the ravages of the disease sufficiently to recover can do so with little deformity and often with none, if taken in the incipiency and are thoroughly treated by one who fully understands the nature of the disease and will spare no trouble and perseverance in keeping up the treatment sufficiently long, directed by common-sense and good judgment.

Rest and fixation are the indications in the treatment, and this in a way that will not confine the patient to the house or bed. The principle involved is to furnish an antero-posterior support to the diseased spine. It matters not what kind of support you use so it is one that will produce *rest* and *fixation* by *antero-posterior* support to the best possible degree. The diseased vertebræ should be protected from jar and pressure until the disease is cured. The jars that come upon the spinal column are chiefly those that are received in bending the column forward, hence importance of antero-posterior support; pressure upon the diseased vertebræ comes from the superincumbent weight of the head and trunk.

A diseased spine should be regarded as a broken spine; then as in other bones of the body the fracture should be reduced and fixed in the best possible position by mechanical means, and then treat the patient on general principles, doing all that is possible to improve the general condition until nature has brought about a repair of the broken spine.

The special kind of treatment will be of little avail without it is directed by one who appreciates fully the gravity of the case, the complications that may arise, and above all the length of time required to pass through all of the stages.

In selecting the kind of mechanical appliance to be used

one must use his own judgment and select the one he best knows how to use, for that is the one that will give him the best results.

I am not an advocate for the use of steel braces, for it has not always been my good fortune to command the assistance of a good instrument maker. Without one is so favored he had better be his own instrument maker. As a rule, the ordinary braces of the shops are about as useless for all cases as are the numerous quack medicines suited for all of the diseases that they are advertised to cure. If you leave the fitting of a brace to an instrument maker, nine times out of ten he will not get the support just where it is most needed. In this way the responsibility is divided between the surgeon and instrument maker; the unfortunate patient is the sufferer for the combination. My experience has been most unsatisfactory with steel braces on account of the difficulty of getting such a fit that efficient support is obtained to the important parts. The most important feature is, after all, that the spine should have constant rest and fixation, and this is impossible to furnish with a removable brace. Patients will interfere with the straps and buckles on the most trivial excuse, and in relaxing the rigid support great damage can be done in a short time to tissues that nature is trying to repair and will succeed in so doing if left undisturbed. The only way to overcome all of the objections that I have mentioned is to select an apparatus that cannot be interfered with by anyone after you have applied it.

From what I have said you have doubtless inferred that my preference is the plaster-of-Paris jacket, and such is the case. Thanks to the genius of the late Dr. Lewis A. Sayre, we have in the plaster-of-Paris jacket an apparatus that fulfils every indication in the mechanical treatment. It makes the surgeon entirely independent of the instrument maker. It puts the poorest patient within the reach of the very best instrument, for the cost of the material in a plaster jacket is not over fifty cents. It cannot be removed at the

whim of the patient, and you always find it just where you put it.

It is quite an art to apply a comfortable plaster jacket, and if it is not comfortable it is because it is not properly applied.

My rule is to use the solid non-removable jacket in the very acute and painful cases, but just as soon as the acute stage subsides I use the removable plaster corset, which is continued just as long as I think there is any danger of a relapse. The average length of time may be estimated at about three years.

When the disease is in the upper dorsal and cervical spine, the head must be supported with the jury-mast or chin support. The latter is my choice, as the former is unsightly and does not afford as efficient support to the head. When a head support has to be used it matters not in my estimation as to whether you use the plaster jacket or a steel brace, for they only furnish a support for the chin rest. In the very acute cases of cervical Pott's, accompanied as they usually are with great pain and spasm, it being impossible to handle these little patients without causing violent paroxysm of pain, I always extend the plaster-of-Paris jacket around the head, only leaving the head exposed. The patient is kept in this until the very acute stage subsides, when a brace or plaster jacket with chin support is applied.

The treatment of Pott's disease by recumbency as a routine method I cannot sanction for reasons already referred to in this paper. It necessitates the patient being confined to the bed for a length of time that seriously interferes with the improvement of the patient's general health, and in this way defeats the object in view.

Within the past few years a great deal has been written on the subject of Calot's operation—the forcible straightening of the deformed spine under an anæsthetic. The reports of this operation have not been very encouraging to me, nor do I believe that the operation bids fair to ever gain very popular favor.

Dr. Royal Whitman, in his recent and most excellent book on orthopedic surgery, says: "The final judgment cannot be passed upon this procedure for many years; it has rapidly lost favor during the past year, partly because of recurrence of deformity and partly because experience has shown that the same degree of rectification may be attained by milder methods."

The most fatal complication of this affection is tubercular spinal meningitis. This is caused by a direct invasion of the tubercle bacilli into the spinal meningeal membranes. The progress of this condition is rapid, and, as far as I have been able to ascertain, is always fatal, hence need not be considered here.

Abscess is the most common complication, and in some cases is a most conspicuous feature; it occurs in about 25 per cent. of the cases. The site of the abscess will vary according to the location of the disease. The lower down the spine the disease is situated the more common it is to have an abscess; this is accounted for from the fact that the vertebral bodies are larger in the lower spine, which gives more cancellous bone for the ravage of the diseased process; hence it follows the more extensive the disease the more apt is an abscess to be present. After the destruction of the vertebræ the pus finds its way into the surrounding tissue and gravitates downward, usually appearing in the sheath of the psoas muscle when the disease is in the lower half of the spine. The abscess may be in the mouth—retropharyngeal abscess—in the neck, axilla, back, abdomen, or groin.

The treatment of the abscess must be regulated by circumstances, as no hard-and-fast rule can be given for its management; this must be considered according to its location, its size, and the general condition of the patient. Experience has convinced me that these abscesses should not be disturbed without they are doing some harm. At any stage of an abscess its progress may be checked and its contents absorbed; such a result is very common. The contents of these abscesses are almost always sterile; secondary infection

is extremely rare before communication with the exterior of the body is established. The abscess is only a symptom. Its early appearance and rapid development indicate an extensively diseased area with great destruction of bony tissue and that a serious case has to be dealt with. A slowly developing abscess has but little significance. At times the abscess may interfere with the proper mechanical treatment. It often prolongs the course of the disease, and while it is never the direct cause of death, yet in the very severe cases the long-continued suppuration will cause amyloid changes that will finally result in death. If an abscess is not present at the beginning of the treatment, we should hope by thorough protection of the spine to prevent it; and if it is present then the protective treatment should be the more thorough.

The surgical treatment of abscesses in Pott's disease is most unsatisfactory, as it is only a symptom of a disease that cannot be eradicated by any known surgical procedure. Being a thorough convert to this view of the subject, the writer does not believe that these abscesses should be incised until absolutely forced to it, and that only when they are about to rupture spontaneously. By incising them the course of the disease is not improved in the least, rather the opposite is the result, for nothing is more mortifying to a patient than having a running sore for months and months, and surely this mental depression will affect the patient injuriously. The writer has seen numbers of cases where the abscess was absorbed; others where the contents solidify and are encased in a tough protective membrane that has been thrown around by the reparative processes of nature, and others where the contents calcify. After the disease has been cured, if the residue of these abscesses give any trouble, it can be removed through an incision, wound closed, and primary union will result. It is regretted that case-histories cannot for lack of time and fear of tiring you be related here to support my view of the subject, but I am sure that many of you have seen such cases.

My rule is to aspirate these abscesses when the prospect is that they will have to be incised; this process can be repeated from time to time as they refill. Occasionally the pus will be too thick to run freely through an aspirating needle. In such cases I use a good-sized trocar and canula. After the abscess is emptied the surface for several inches around should be strapped with adhesive plaster and snugly bandaged. This process will often cause the walls of the sac to adhere. When incision is forced upon you it should be done so as to insure the best possible drainage, and at all subsequent dressings the best antiseptic precautions should be the rule.

I am thoroughly convinced that the injection of anti-tuberculous emulsions, so-called, into the abscess cavity is absolutely useless. How could it be expected that a chemical of any kind applied to the abscess sac that is nothing more than a pus reservoir should affect an osteitis that is the source of the pus and often several inches distant from the abscess? If the emulsion was injected into the carious bone it would be reasonable to expect some good results. Even this has been done by many, but has long been abandoned as being useless.

Compression myelitis is quite a common complication, occurring in about 15 per cent. of the cases, and is caused by pressure on the cord by the thickened membrane of the cord from contiguity and not from a direct invasion of the membrane by the tubercular process as in meningitis. As the tubercular inflammatory process involves the periosteum, the collection of pus pushes into the spinal canal; later the dura mater becomes involved, aiding in the pressure, and as a result we have a pachymeningitis externa, and not infrequently a pachymeningitis interna following. Add to these the fact that the spinal canal is narrowed somewhat by the angular deformity, and it is readily appreciated how the nervous function of the cord can be inhibited by pressure. There have been reported a few cases of pressure paralysis in this affection, caused by the sudden crushing of a vertebra,

causing a fragment of bone to impinge on the cord ; but such cases are extremely rare. The spontaneous recovery of compression myelitis in Pott's disease contraindicates the inflammation of the membranes of the cord, which causes the compression, being of a tubercular nature. It is a fact that the greater number of cases of compression myelitis are developed before there is any deformity. In many cases the paralysis arouses the first suspicion of Pott's disease. It is by no means the rule that paralysis follows the most prominent deformities ; in fact, quite the opposite is the rule, for the deformities develop quite gradually and rather late in the disease ; often the inflamed condition of the membranes has subsided. This gives the cord more time to accommodate itself to the changed position.

The liability to compression myelitis varies with the seat of the disease, being most common in the upper dorsal region ; next in frequency in the cervical region and then in the lumbar. The explanation is that in the upper part of the bony column the spinal canal is narrower and is more liable to aggravated forms of the disease with accumulation of pus. Dr. Gibney, of New York, reported a few years ago 295 cases of tubercular spondylitis with 62 cases of paralysis ; in 189 of this number the disease was in the upper dorsal cervical spine with 59 cases of paraplegia ; in the 106 remaining cases the disease was in the lower dorsal and lumbar spine, with 3 cases of paraplegia. Many statistics on this subject are quoted by authors in their writings.

Prognosis of paraplegia is very favorable; in properly treated cases a very small percentage of the cases fail to recover. Recurrence is not infrequent. Dr. Whitman says : "Relapses depend upon the situation or upon the renewed activity of the disease, and are often explained by the neglect of protective treatment." Usually the paralysis lasts from a few months to a year or more. Recovery will often occur even after the paralysis has lasted more than a year. I have a case under my care at present in whom the paralysis came on very gradually and did not reach its maximum for

more than a year, during which time the most active treatment was kept up. A perfect recovery was the ultimate reward for persistent treatment.

Recovery from the paralysis depends upon the course of the disease of which it is a symptom and upon the absorption of the infiltration of the tissue that presses upon the cord. The symptoms of Pott's paraplegia are very well defined and need not be described in a paper of this kind. The trouble that will be encountered will be in those cases in which it is one of the early symptoms of Pott's disease, preceding the formation of any deformity in the spinal column, and even here one who is accustomed to observing these cases should not encounter any difficulty, as it will be preceded by the early symptoms above described. Only in the most severe cases is there any disturbance of sensibility, which is due to the fact that the position of the sensory nerves in the gray matter of the posterior cornua protects them better than in the case with the motor fibres in the pyramidal tract. The condition of the reflexes is interesting. An exaggeration of the patella reflex is an early symptom. If the seat of the compression is above the patella reflex are in the upper lumbar region, there will be an exaggerated patella reflex, due to the inhibitory influences being cut off. The tendon reflexes will vary from a slight exaggeration of the normal to so great a degree as to show in the lower extremities a pronounced type of spastic paralysis ; likewise the ankle clonus will vary ; often there will be a general tremor of the legs.

The treatment of the paralysis is included in the treatment of the disease of which it is only a symptom, except that even greater care should be exercised to maintain the most rigid fixation of the spine.

Iodide of potash is the most useful of the internal remedies, and, with the exception of such remedies as will improve the patient's general condition, is the only one that need be used. It is supposed to act upon the tubercular granulation tissue as it does upon the products of syphilitic

disease. It should be given to the point of tolerance, beginning with a five-grain dose and increasing one grain each day. In the case above referred to I increased the dose until the child, aged eight years, took sixty grains three times a day, which was continued for about six months. As soon as improvement is noticed, massage to the limbs will be indicated.

Operative treatment for the relief of the pressure on the spinal cord was at one time in favor, but it has fallen into disuse with all except the most radical of surgeons. Laminectomy should have no place in the routine of the treatment of this disease ; if it is used at all it should be reserved for the very worst cases that have failed to give any result after a long and faithful trial of the conservative line of treatment that I have indicated.

CLINICAL REPORT OF TWO CASES OF OSTEO-SARCOMA OF THE INFERIOR MAXILLARY TREATED BY EXCISION,

WITH REPORT OF THE CONDITION OF THE PATIENTS AFTER ONE YEAR.

By Hermann B. Gessner, M.D.,
New Orleans, La.

Case I.—Owen G., colored, male, aged forty years, field-hand by occupation, was admitted to Ward 1, Charity Hospital, New Orleans, May 1, 1900. The organs of circulation and respiration and the liver were found on examination to be normal. The urine was of specific gravity 1015, acid, presenting leucocytes, bladder epithelium, urates. He gave a history of moderate indulgence in alcoholic drinks.

Both parents died of "dropsy;" no history of malignant disease in his family could be elicited.

The personal history given as bearing on the existing trouble was that extraction of some teeth from the left half of the lower jaw, about Christmas, 1899, had been followed by the appearance of a growth.

Examination showed the presence of a tumor about two inches in diameter, involving the entire thickness of the left half of the inferior maxillary, to the extent of the posterior half of the body and lower half of the ramus. This tumor (Fig. 1) was dense and hard to the touch externally; there was no involvement of the skin. On its inner aspect it was elastic and presented cysts. There was no infiltration of the floor of the mouth; the tongue was pushed aside. Pain of a shooting character was complained of.

A diagnosis of osteosarcoma was made, based on rapidity of growth, pain, and cysts; the site of the growth and the race of the patient were looked upon as collateral points in support of the diagnosis.

Operation was offered and accepted. It was performed May 11th after preliminary preparation, locally with mouth-washes, systemically with strychnine sulphate and tincture of digitalis. The anæsthetic was chloroform, administered *guttatim*.

The incision was begun over the symphysis, below the lower lip (which was not divided), and carried down the median line to the lower border of the inferior maxillary, along the lower border to the angle, and finally along the posterior border of the ramus to near the lobule of the ear. In making the last part of the incision the skin only was divided, injury to the parotid gland and facial nerve being avoided.

The left lower lateral incisor was extracted, following which a Gigli saw was introduced on the inner side of the bone and made to divide it through the empty tooth socket.

The soft parts were separated from the bone on its external and internal aspects with a scalpel; the periosteum was left untouched, to be removed with the bone.

Disarticulation was effected with stout scissors, while the bone was forcibly depressed.

Some enlarged lymphatic glands were removed, together with the submaxillary salivary gland, over which they lay and to which they adhered.

Catgut (Kumol) was used to approximate the mucous surfaces, which came together with a moderate degree of tension, silkworm-gut for the skin wound. The latter was left partially open for gauze drainage of the space left by the removal of the glands above referred to.

The tumor was submitted to Dr. O. L. Pothier, Pathologist to the Charity Hospital, who reported it to be "sarcoma," without specifying the character of the cells. A further examination could not be made, when requested, because the preparation had been misplaced.

The after-treatment consisted in stimulation with strychnine and digitalis, feeding with liquids (milk, beef elixir, broth) through funnel and rubber tube, and cleansing of the mouth with a 50 per cent. solution of hydrogen peroxide in hot water.

Infection manifested itself in the next two days. The catgut gave way quickly and allowed the opening in the mucous membrane to gape widely. There was much swelling in the face and scalp, with sharp oscillations of temperature. A small collection of pus was discovered in the right upper eyelid, which was evacuated with a scalpel. Free stimulation was kept up, together with daily cleansing of the wound by copious irrigations with formalin solution (1 to 1000) and free injection of hydrogen peroxide in full strength.

The constitution of the patient asserted itself, with the result that on June 7th all the wound had healed save two small, granulating areas, one near the ear, the other near the median line. The tongue was observed to be well supported and under fair control.

July 2d a 0.2 per cent. cocaine solution (Schleich formula) was used for analgesia by infiltration, while a spiculum of bone and a breaking-down gland were removed from the neck just below the symphysis. This wound healed primarily. The patient was discharged on July 15, 1900. Fig. 2 shows his appearance at this time.

I have from time to time received favorable reports on his condition. The last was dated November 8, 1901, coming from Dr. A. Feltus Barrow, of St. Francisville, La., who stated that he had made a close examination a few days previously and found him absolutely well.

Case II.—David W., colored, male, aged thirteen years, was admitted to Ward 1, Charity Hospital, New Orleans, June 27, 1900.

No family history could be obtained. Inquiry into the personal history elicited the fact that he had had a swelling of the lower jaw since the age of four years. This had been

of the size of his thumb up to Christmas, 1899, when it began to grow quite rapidly.

Examination of the organs of circulation and respiration, as well as of the liver, showed them to be normal. The urine was of specific gravity 1023, acid, with leucocytes and urates.

On admission into the ward he presented a hard, inelastic tumor of the inferior maxillary (Fig. 3), extending from the angle on the right to the first bicuspid on the left, and measuring about one and a half inches in diameter. The entire thickness of the bone was involved. The teeth between the second right molar and the first right bicuspid were absent. Between these two teeth was a trough corresponding to the projection of the upper teeth, and bounded by a ridge of tumor on either side.

Neither the skin nor the mucous membrane of the floor of the mouth was involved; the tongue was displaced by the internal projection.

Pain, if present at all, was not severe, for no complaint was heard from the boy regarding it.

A diagnosis of osteosarcoma was made, based largely on the rapid extension of the growth since Christmas of the preceding year. Age, race, and the location of the tumor were allowed to have some weight in determining the diagnosis.

After preparation, local and systemic, along the same lines as those followed in Case I., operation was performed July 7th, under chloroform anæsthesia. An incision was carried along the lower border of the jaw from the angle on the right to the first bicuspid on the left. The facial vessels were divided between two forceps on the right side. The soft parts were dissected up from the bone (internal and external surfaces) to the extent of the external incision, leaving the periosteum to be removed with the tumor. The mucous membrane was divided with scissors above and below the growth. A Gigli saw was used to divide the bone, passing through sound structure about one-quarter of an inch from the growth at each end.

FIG. 1.

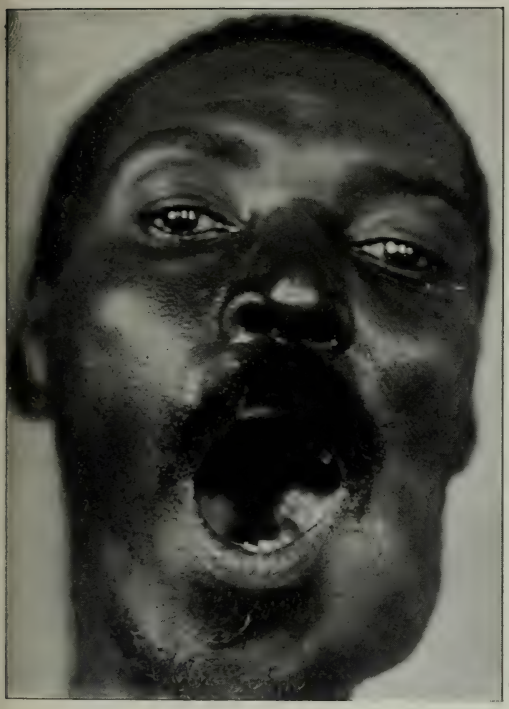


FIG. 3.

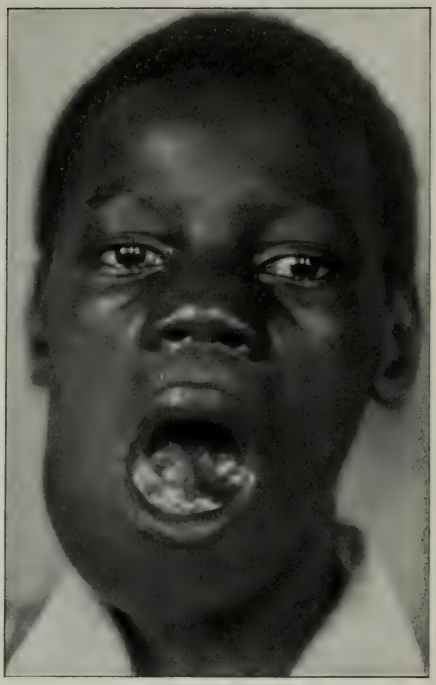


FIG. 2.

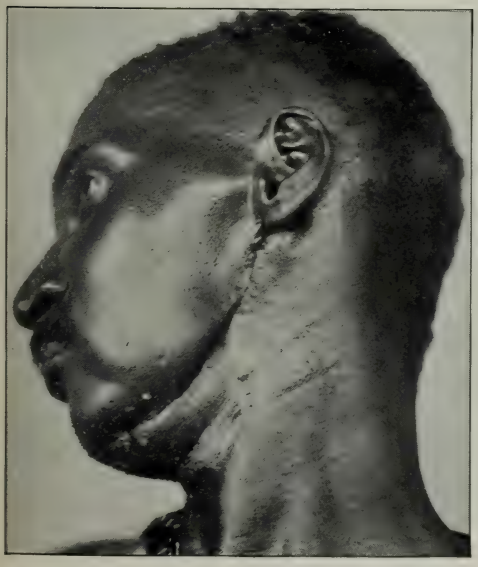


FIG. 4.

The growth having been removed, the proper closure of the resulting wound was now to be effected and provision made for the support of the tongue, which had lost its attachment by means of the geniohyoglossus and geniohyoid muscles, to the genial tubercles on either side of the symphysis internally. A piece of silver wire, one-eighth of an inch thick and six inches long, bent so as to represent the contour of the jaw, was employed to support the tissues until healing should have taken place. Each end (slightly tapered) was pushed into the inferior dental canal of the corresponding bone stump.

The mucous membrane was brought together with interrupted silkworm-gut sutures, alternating with catgut sutures. The muscle surfaces were brought together with silkworm-gut over the wire splint, especial care being taken to fix the origins of the geniohyoglossus and geniohyoid in this manner, so as to prevent the falling back of the tongue, which would otherwise have resulted.

The skin wound was closed with silkworm-gut.

At the end of the operation the mouth was found to be deformed, remaining open in circular form.

The tumor was examined by Dr. Pothier, who reported it to be a giant-cell sarcoma. In cross-section the growth showed, macroscopically, a thin, circumferential shell of compact bone inclosing a softer structure which resembled the cut surface of a turnip.

The after-treatment, identical with that of Case I., was more successful. No infection followed except such as was shown by a slight superficial suppuration along the line of the skin sutures.

July 13th the boy could approximate his lips for the first time. July 18th he could protrude the tongue, showing the good support afforded the geniohyoglossus by the suturing around the wire splint. July 27th a small necrotic fragment of bone was discharged; there was fair control of the "jaw," as shown by the range of movements of the teeth in the stump of the left side (second bicuspid, two molars). About

this time the silver appeared to be causing some irritation. Two sinus openings were found on the right side, discharging pus moderately.

August 2d chloroform was given; through a sinus opening near the angle of the jaw on the right the wire splint was removed, as well as some detached silkworm-gut sutures. The sinuses were curetted and packed with 10 per cent. iodoform gauze. August 16th chloroform was administered for the third time and a sinus near the median line incised; bone fragments and silkworm-gut were removed and a gauze pack introduced.

September 4th the boy was discharged, well.

Fig. 4 shows his appearance at this time. The tendency of his mouth to remain open persisted to the last day of his stay with us, though the control of the orbicularis oris was excellent at that time. The left jaw-stump, while serviceable, was constantly deviated inward, probably as the result of the unresisted pull of the pterygoids.

The last report on his condition was received August 14, 1901, from Dr. C. J. Gremillion, of Alexandria, La., who stated that he had seen him the day before and found "no sign of recurrence."

In concluding my report of these cases I wish to acknowledge my indebtedness to Drs. F. W. Parham and E. D. Martin, fellow-members of this body, the former having confirmed the diagnosis in Case I., and the latter having assisted me in both operations, as well as to Mr. T. C. Sexton, interne, for valuable assistance in the after-treatment of these cases.

Credit is due the pathological department of the hospital, of which Dr. O. L. Pothier is chief, not only for the microscopical examinations of the tumors, but also for the photographs of the patients.

COMMENT.

Diagnosis. The characteristics which distinguish malignant from benign tumors are vascularity, rapidity of growth, pain, invasion of neighboring tissues, involvement of lym-

phatics (epithelial type of tumors only), metastasis, ulceration, and cachexia. Of these symptoms the growth in Case I. presented rapidity of growth and pain, while in Case II. rapidity of growth alone was present to indicate the malign character.

Of the special characteristics of the mesoblastic malignant tumors (sarcomata) Case I. presented cysts; while the age (forty years) and the presence of lymphatic gland involvement were not in favor of this diagnosis, though not weighing strongly against it.

In Case II. the age (thirteen years) pointed to sarcoma, unsupported by other evidence. In both cases the site (lower jaw) and the race (according to R. Matas, "Surgical Peculiarities of the Negro," Dennis' *System of Surgery*, vol. iv.) favored the diagnosis of sarcoma.

Treatment. My experience in Case I., as well as further experience in similar more recent cases, has caused me to give up catgut for the approximation of the mucous surfaces after operative work about the mouth. Continually bathed in the saliva and exposed to its softening influence, in this region the life of catgut is short and its use unsatisfactory. Silkworm-gut would seem to be the best material here, having the advantage of being less hygroscopic than silk, the other possible substitute for catgut in common use. The disadvantage of having to remove the silkworm-gut ultimately is small in comparison with the greater protection against infection afforded by it at the time when this is so important.

I wish to express my satisfaction with the wire splint used in Case II., in the application of which I received valuable assistance from Dr. Martin, who has used similar devices in several cases of operation about the lower jaw involving the sacrifice of the symphysis and its muscle attachments.

Result. I do not wish to be understood to report these two cases as cured after freedom from recurrence for eighteen months and thirteen months, respectively, though the pathologist's finding of "giant-cell sarcoma" in Case II. makes me more hopeful of a cure in that instance. The facts are

stated as they stand at this time. Should the future bring forth any new development in either case I will make it known.

I trust that the report may be of some value as a fairly accurate description of the cases referred to, and that it may play its part in bringing into the literature two successful cases of excision of the inferior maxillary which will tend to lower somewhat the present operative mortality of nearly 14 per cent. (Butlin).

THE ANGIOTRIBE: ITS USE AND ABUSE.

By James N. Ellis, M.D.,
Atlanta, Ga.

The angiotribe as now constructed, while doubtless susceptible of further modification and improvement, is such a valuable aid to the surgeon, and has such an extensive field of usefulness, that I am surprised at the rarity of its presence in the instrument tray and the parcity of allusion to it in current surgical literature. Angiotribes made after several designs are now obtainable, notably those of Doyen and Tuffier, of Paris; Thumin, of Berlin, and Dougal Bissell, of New York.[1] The one with which I am most familiar, and have found most satisfactory, is that of Dr. Doyen. He was the first to conceive a practical idea of this instrument, and submitted a design to Collin for manufacture, in May, 1896, but it was not until the following year, and after many modifications of the original design, that it was perfected and given to the profession, practically as at present, and called by him a "progressive pressure forceps" (pince á pressue progressive).[2]

[1] The instrument of Dr. Bissell, which he designates "écraseur," and which I have never used, has been recently modified both in principle and shape, and is highly commended in a personal communication from Dr. Clement Cleveland, of New York. He says: "It can be used absolutely without fear in place of ligature." This is high commendation from a distinguished gynecologist who has been constantly practising angiotripsy for the past two and a half years.

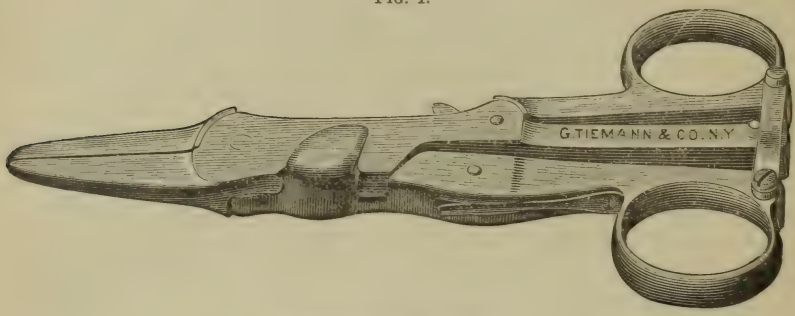
Tuffier's instrument differs from that of Doyen in that the blades on their clamping surface present a central longitudinal groove, and compression is effected by means of a wheel or windlass-like attachment, instead of the extra lever.

The instrument of Dr. Thumin, the assistant of my preceptor, Professor Leopold Landau, of Berlin, is but a modification of that of Dr. Doyen, consisting in the grafting of Tuffier's windlass upon Doyen's extra lever.

[2] Tuffier's instrument, which he called an "angiotribe" (vessel-crusher), followed one year later. Dr. Cleveland considers the name a misnomer, claiming that the microscope proves that the tissues, after the proper use of this instrument, are *compressed* and not *crushed*.

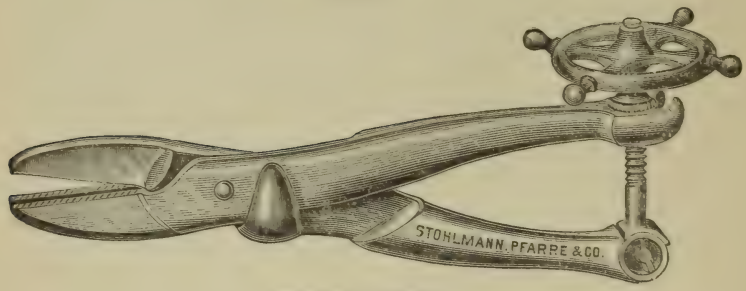
This powerful instrument is so constructed as to transmit the effort exerted by the hand, multiplied twenty times, to the tip of the shanks, enabling one to compress the most

FIG. 1.



Angiotribe of Dr. E. Doyen.

FIG. 2.



Tuffier's angiotribe.

FIG. 3.

Angiotribe of Dr. Dougal Bissell.

voluminous pedicles to the thinness of a sheet of paper. This great multiplication of the manual effort is effected

through the medium of an extra lever, which can be utilized or not at the discretion of the operator. So long as this extra lever is attached by its catch to the main arm of the angiotribe the instrument is used like an ordinary clamp, and the compressing force at the tip of the shank is equal to the effort of the hand multiplied by two. Applied, for example, to the pedicle of an ovarian cyst, the handles are progressively pressed together and held in position by the automatic, ratchet-like catch at the manual end of the main lever. This gives a compressing power at the tip of the shanks equal to twice the force exerted by the hand, and is sufficient for many of the purposes for which the instrument is designed. To increase this force it is necessary to bring into play the extra lever, which, up to this time, has been idle. In order to do this we release it from the catch which holds it in place, and lift it from the main lever. The distal end of the extra lever now engages beneath the crochet of a transverse traction limb, attached midway of the opposing main lever, and the manual effort progressively exerted at the handles is now transmitted to the tip of the shank, multiplied twenty times.

The levers and bolts of this instrument are so designed and executed as to permit of the exertion of great force without yielding at any point, being capable of safely sustaining a force giving from two to three thousand pounds pressure at the tip of the shanks, which can be easily exerted without impairing the delicate tactile sense it is necessary to preserve in the hand in order to properly estimate the degree of pressure appropriate to each case.

When sufficient pressure has been maintained for the requisite length of time, and it is desired to remove the instrument, the extra lever is first lifted and disengaged from the crochet on the transverse bar and reattached to the main lever by the catch at the manual extremity ; the automatic catch of the main levers is depressed, the handles gently separated, and the instrument removed.

The portion of tissue which has been included between

the jaws will now be found to have been compressed to the thinness of paper. The watery elements of the adipose, muscular, and elastic tissues in the track of the angiotribe have been pressed to the sides of the shank of the instrument, leaving only the fibroserous and cellular coats of the vessels and a thin, ribbon-like sheet of compact connective tissue in the channel of the instrument. The nerve cords and the middle and inner coats of the arteries and veins are completely severed, the latter retracting, incurvating, and occluding the lumen of the vessels as when subjected to torsion. The lymphatics, in common with the outer coats of the veins and arteries, are firmly agglutinated and rendered impermeable.

According to Thumin, a microscopical examination of this compressed tissue shows that its integrity is not completely destroyed, but that it is simply compactly compressed ; and observation proves that necrosis and sloughing do not result, but that a gradual process of revitalization takes place.

Thus, it will be seen that the principle underlying angiotripsy is as old as the pile-clamp, the écraseur, and the practice of torsion. The existence of the angiotribe, in fact, is the outcome of the efforts of the French gynecologists to find a substitute for the temporary clamp applied to the broad ligaments in vaginal hysterectomy; and, just as the permanent silk ligature, with its occasional train of annoyances in this operation, yielded place to the temporary clamp, so, now, the clamp gives place to the angiotribe, which accomplishes in two or three minutes, with a minimum of pain, danger, and discomfort, that for which from twenty-four to forty-eight hours was required by its immediate predecessor.

The practical application of the angiotribe will suggest itself to every thoughtful surgeon. It is useful wherever it would otherwise be necessary to ligate, *en masse*, a vascular pedicle, reducing its bulk to the least possible dimensions consistent with safety, and by the action of the angiotribe alone, or with the aid of a supplementary ligature

of very fine catgut, assuring perfect primary and permanent hæmostasis.

Some excellent surgeons who have been using the angiotribe for years express entire confidence in its unassisted power to insure perfect hæmostasis; while others, with less temerity or greater caution, habitually employ reinforcing ligatures. In this, as in most other controversies, the truth will be found to lie in a mean between the two extremes. In my opinion, it is not safe to depend absolutely in all cases upon securing permanent hæmostasis by compression with the angiotribe alone. The possibility of secondary hemorrhage after an apparently satisfactory compression of several minutes, though remote, is a danger that has occasionally materialized in the practice of those who have had an extensive experience in the use of this instrument and have depended solely upon it for permanent hæmostasis. Personally, such an accident has never occurred; but in vaginal hysterectomy I have occasionally seen a uterine artery, temporarily controlled by the application of the angiotribe, bleed freely at the moment of making the toilet of the field of operation. The friction of the gauze sponges had separated the compact fibrous lamella produced by the action of the angiotribe, and the thus impaired obstruction to the artery permitted free hemorrhage, necessitating the application of a ligature. Consequently, when the pedicle contains voluminous vessels, and when subsequent hemorrhage would be very dangerous, I now habitually reinforce the hæmostatic action of the angiotribe by placing a very fine ligature, preferably of catgut, in the channel made by the jaws of the instrument. This may seem an unnecessary precaution to many; but when it is estimated that without the reinforcing ligature secondary hemorrhage will occur once in fifty times the danger becomes apparent, and the surgeon who would terminate an intraperitoneal operation with this possibility unguarded seems inexcusably negligent.

It is impossible to formulate a fixed rule as to when it is necessary to supplement the action of the angiotribe by the

precautionary ligature. This is a matter which will be determined by the judgment, observation, and experience of the individual operator. A cautious surgeon will use the ligature when in doubt, gradually dispensing with it more and more as he gains confidence in the hæmostatic power of the angiotribe.

In spite of this uncertainty, which limits the use of the angiotribe, it still fulfils many important functions. By reducing the pedicle to the smallest possible dimensions it enables us to habitually use, with perfect safety, small, readily absorbable ligatures; or those who doubt their ability to secure sterile animal ligatures can substitute the finest silk ligature for the voluminous one it would otherwise be necessary to use.

Those of us who have occasionally had to deal with the annoying consequences incident to the presence of a mass of irritating, unabsorbable silk in the intolerant tissues will appreciate that any method which permits of safely dispensing with its use is a real advantage. Personally, I have no hesitancy in using catgut, and believe that the smaller sizes can be easily and perfectly sterilized; the larger sizes, on account of the increased resistance to the penetration of the sterilizing agent, being more difficult of safe sterilization.

The mere reduction of a large, resilient pedicle to an unresisting, ribbon-like mass of insignificant size, leaving a mere point or line for cicatrization, easily covered by the peritoneum when intra-abdominal, and with the danger of post-operative adhesions diminished to the vanishing point, are some of the advantages, independent of its hæmostatic power, incident to the employment of the angiotribe. Its intelligent use, however, insures practically bloodless surgery, thus greatly contributing, in common with the above factors, to the securing of comparative freedom from post-operative shock, a marked diminution of post-operative pain, and an almost uniformly rapid and uncomplicated convalescence.

The amount of force it will be necessary to exert, and the length of time it is desirable to apply it, will vary with the varying consistence of the tissues involved, the size of the pedicle, and the object it is desired to attain. With a dense, resistant pedicle, such as is found in the lower segment of the broad ligament, for instance, when it is desired to effect permanent hæmostasis with the angiotribe alone, the maximum pressure of three thousand pounds, continued for three minutes, will be required to safely occlude the uterine vessels. If, however, a supplementary ligature is to be used, the time of the application of this force may be materially shortened. The upper border of the broad ligament is more fragile and should be compressed with caution, especially when the tubes and surrounding tissues are thickened and soddened by septic inflammation. Too energetic compression here, brusquely applied, will not only crush through the friable tissue composing the ligament proper, but completely sever the ovarian vessels as well.

Preliminary to section of hollow, serous-covered viscera, such as the intestine, compression should be moderate and progressive, stopping short of cutting through the serous coat. The omentum and mesentery also require to be cautiously compressed, but with sufficient force to displace the adipose and cellular elements without rupturing the fibrous connective tissue, reducing thickened, inflamed omentum to the thinness of normal peritoneum without cutting through the outer coats of the bloodvessels. The arteries traversing such structures as the peritoneum and omentum are, apparently, immediately obliterated; but here, especially if they are of considerable size, it is essential to use a supplementary ligature. One soon learns, however, to correctly estimate the resistance of the tissues grasped in the jaws of the angiotribe, and to accordingly moderate the pressure or increase it to the maximum; and in this, as in other surgical manipulations, the personal use of the instrument and the resulting practical knowledge of the varying resistance of different structures are essential to the best success.

The angiotribe is manifestly inapplicable to the control of hemorrhage in sections or wounds of the substance of such friable organs as the liver, spleen, or kidney, the jaws of the instrument cutting through such fragile tissue instead of condensing it; but its utility in retroperitoneal and transperitoneal nephrectomy and in splenectomy is evident. Its hæmostatic action is serviceable in the formidable operation of gastrectomy, and, in fact, can be utilized to advantage in nearly every operation of any magnitude which the surgeon is called upon to perform within the abdominal and pelvic cavities.

In vaginal hysterectomy angiotripsy is particularly advantageous, and I have entirely discarded the temporary clamp, which was left on for twenty-four or forty-eight hours for the extemporaneous compression of the angiotribe, followed by the application of a No. 2 chromicized catgut ligature. These ligatures are subsequently absorbed or come away with the discharges, and require no further thought or care. The reduction of the tissues to be ligated in this operation to the least possible volume consistent with safety diminishes proportionately the amount of necrotic débris to be subsequently eliminated, and insures a more painless and prompt convalescence.

In supravaginal hysterectomy it serves a useful purpose not only for compressing the broad ligament, but for crushing the cervix at the point of amputation, thus firmly agglutinating the opposing walls of the cervical canal, lessening the chances of immediate infection from that source, and precluding the possibility of subsequent ascending infection from the vagina. The uterine arteries may be grasped in the jaws of the angiotribe at the same time; and it is my habit to transfix the compressed cervix, antero-posteriorly, with a double No. 2 chromicized catgut ligature, tying to either side, including the compressed uterine vessels, and covering over by approximating the peritoneal flaps with a continuous suture of No. 0 catgut.

The use of the angiotribe in hysterectomy for fibromyoma

robs the operation of much of its danger and difficulty. The management of the vascular, cavernous-like sinuses coursing between the layers of the broad ligament no longer causes anxiety and uneasiness. Permanent ligatures can be safely dispensed with, the vessels more securely disposed of, primary hemorrhage abolished, and the time of operation materially shortened.

For the removal of approximately normal adnexæ, or the excision of comparatively small ovarian or intraligamentous cysts, the angiotribe alone may be absolutely depended upon for hæmostasis.

The application of the angiotribe to the appendix vermiformis, when the stump can be satisfactorily dealt with after some such method as that suggested by Dawbarn or McBurney, is unnecessary and unjustifiable, but it is frequently serviceable in the management of a redundant meso-appendix.

The use of the angiotribe, however, is by no means limited to operations upon the contents of the abdominal and pelvic cavities. Coupled with the precautions herein suggested it may be safely depended upon to occlude arteries of any size, in any part of the body, up to that of the brachial.

In no surgical procedure has it rendered me better service than in the operation of thyroidectomy. If excision of one lobe only is contemplated the usual incision is made and the isthmus exposed and sectioned. The lobe to be excised is bluntly dissected from its attachment to the underlying trachea and lifted up. Compression is first applied above, where the superior thyroid vessels lie, the ligature tied securely in the groove made by the angiotribe, and the pedicle severed on the side next the tumor; then the inferior thyroid vessels at the back of the lower extremity of the lobe are similarly treated, care being exercised not to include the recurrent laryngeal nerve, which, however, usually lies safely embedded in the groove between the trachea and the œsophagus. If, as has once happened to me, this nerve should be accidentally included in the grip of the angio-

tribe, respiratory disturbances would immediately sound the alarm. For complete thyroidectomy the necessary modification in the technique will readily suggest itself; and it is especially in exophthalmic goitre, where hemorrhage, both primary and secondary, is so commonly a cause of disaster, that this instrument justifies the enthusiasm of its advocates.

In the removal of pedunculated keloids or vascular surface growths of similar conformation, and for the compression of the spermatic cord and vessels in castration, it has done me good service.

In elephantiasis of the labium, clitoris, or scrotum—a comparatively rare but not unknown disease in this country—operation is safely simplified by the use of the angiotribe. In the former condition the affected labium is grasped in the hand and pedunculated by traction. The incision through the integument is followed by sufficient retraction of the skin to permit the application of the angiotribe to the denuded pedicle, which is bloodlessly severed after three minutes' application of maximum pressure. This procedure in scrotal elephantiasis should be preceded by segregation of the penis and testicles, the denuded organs being held safely aside by an assistant. Repeated successive applications of the angiotribe when the pedicle is very large will be necessary here, each subsequent compression being preceded by section of the compressed tissue with knife or scissors, until, finally, the entire pedicle is progressively compressed and severed. Hemorrhage, the greatest danger in this operation, is obviated, and cicatrization takes place readily and rapidly along the margin of compactly compressed parchment-like tissue, with a minimum amount of the offensive discharge and sloughing incident to the slow process of granulation common to former methods.

As a substitute for the pile-clamp in the operation for hemorrhoids the angiotribe is a delight to work with. Dr. Robert T. Morris, in a personal communication on the subject, says that "it not only destroys the vessels, but also

the nerves, so that the patient is unaware that an operation has been done." It is equally satisfactory in rectal surgery, for extirpation of the redundant tissue which is incident to the operations for prolapse of the rectum, and is a useful adjuvant in the execution of any of the many methods of proctectomy and procto-sigmoidectomy now in vogue.

In the extirpation of enlarged cervical, axillary, or inguinal lymphatic glands the communicating chains of afferent and efferent lymphatics may be forcibly compressed and rendered impermeable before section, making subsequent leakage of lymph impossible, and thus greatly facilitating primary union.

A smaller model of this instrument is obtainable, with sufficient power for the compression of the less resistant tissues. It is useful in the circumcision of infants, for compressing the frænum in the circumcision of adults, in appendectomy (where it is desired to use the angiotribe), for the umbilical cord of the infant, the ductus choledochus in the extirpation of the gall-bladder, small ovarian pedicles, and, in a word, all pedicles of insignificant resistance or dimensions.

It was the intention of the author to report, in this connection, some cases from a series of major operations performed in the past three years with the assistance of the angiotribe, illustrative of its use and value as attested by results in the shape of a zero mortality and comparatively uncomplicated convalescences; but this would necessitate exceeding the limits assigned to this paper, and must be deferred.[1]

[1] Dr. Hugh M. Taylor, in a paper read at the fifty-first annual meeting of the American Medical Association, says that his experience in angiotripsy, limited to some twenty-five or thirty suprapubic sections, fully sustains the advantages claimed for the angiotribe. He emphasizes the necessity of applying the jaws of the instrument at right angles to the vessels, the transversely ruptured inner coats approximating more thoroughly and occluding the lumen of the vessels more efficiently than when the compression is made obliquely.

MYOMECTOMY UPON THE PREGNANT UTERUS, WITH REPORT OF A CASE.

By R. E. Fort, M.D.,
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Uterine fibroma is a benign tumor originating and developing in the uterine muscular wall or in some of its outlying processes, and composed of muscular and fibrous tissue in varying proportions.

They probably exist congenitally, but, with few exceptions, do not develop until the age of puberty or the period of uterine hyperæmia. Such a tumor may remain in its original position or may be forced by contraction of the surrounding uterine fibres into a closer relation with the mucous membrane internally or the peritoneal covering externally. It is this phenomena which gives us the different varieties of fibromata.

The varieties are: 1. Subperitoneal, which are pedunculate or sessile. 2. Interstitial. 3. Submucous, which are pedunculate or sessile. 4. Fibromata of the round ligament. 5. Fibromata of the cervix, which may be within the broad ligament or upon the external os.

The complication of pregnancy in the fibromatous uterus is grave and not as rare as is supposed, as it is well known that sterility or early abortion is regarded as almost constant sequelæ of this condition. Pregnancy rarely complicates the submucous variety, occasionally the interstitial, but does complicate the subperitoneal variety with comparative frequency, as is shown by different observers. Gueterez states that of 295 myomatous women 51 became pregnant, or

about 17 in every 100. Durkee, quoted by Howard Kelly, makes the proportion only 2.03 per cent.

I cannot coincide the wide difference in the statistics of these two surgeons, but it is an established fact that many myomatous uteri carry their pregnancies to term and are delivered without difficulty. The myomata in these cases are generally of the pedunculated, subperitoneal variety.

The consensus of surgical opinion is—and my own observation bears this out—that small myomata situated upon any portion of the uterine body do not generally interfere with normal pregnancy and delivery if they be of the pedunculate variety.

It is also the consensus of opinion that sessile myomata will produce abortion, although I have observed two—one quite the size of an egg—neither of which interfered with pregnancy or parturition.

If the tumor is situated upon the lower third of the uterine body or upon the cervix, and is of any size, prompt intervention is demanded; first, because the progress of pregnancy will most probably be interrupted; second, should pregnancy progress to term, descent of the uterus into the pelvic cavity will be seriously impeded, and there will be a serious mechanical obstruction to delivery.

Before referring to myomectomy it is only proper that the other methods of intervention which have been resorted to in this condition should be mentioned. Susserot out of 147 pregnancies complicated by fibroma says that forceps were applied in 20, with the result that 8 mothers and 15 children succumbed. Version was performed in 20, of which 12 mothers and 17 children were lost. In 21 cases it was necessary to artificially extrude the placenta, and of these 13 mothers died. Collectively the maternal mortality was 53 per cent. and that of the children 66 per cent.

The other obstetrical operations which have been suggested are: 1. Artificial miscarriage. 2. Premature artificial delivery. 3. Craniotomy and cranioclasty. 4. Cæsarean section. These all have for an end the emptying of the uterus without

attacking the tumor, and should, therefore, be termed palliative procedures. The radical operations have a double end in view—emptying the uterus and extirpation of the fibroid.

Vaginal enucleation may be practised in the cervical variety projecting into the vagina. If at term, or the fœtus is viable and delivery is impossible or even improbable, hysterectomy, Porro-Cæsarean section, or simple Cæsarean section, with removal of the ovaries have been suggested. It must be conceded that in the gravest of the fibromatous conditions hysterectomy is indicated, but the procedure which appeals to me as both rational and conservative would be Cæsarean section and myomectomy in a majority of cases.

Formerly Porro's operation, or complete hysterectomy, was the method used in dealing with all pregnant myomatous uteri, irrespective of viability, location, or character of the tumor. The excuse for these methods has been that violence done the uterus in the performance of myomectomy, and the consequent uterine contractions, is nearly always followed by abortion.

Statistics extending over more than than twenty years, or from the birth of aseptic surgery to the present day, will not give foundation for this belief.

R. H. Turner, of Paris, in a monograph published in 1900, gives the following statistics of myomectomy during pregnancy:

Between the years 1874 and 1890, 33 of these operations were reported, with 61 per cent. fœtal mortality and 36 per cent. maternal mortality; but between the years 1890 and 1900 the reported operations are 44, with only 21 per cent. fœtal and 9 per cent. maternal mortality.

Of the 79 per cent. of pregnancies in the latter series, or children who survived the operation, 25 went to term, 2 went to eight and one-half months, 3 to seven and one-half months, and 3 are reported as having continued; the results of 2 of these 3 is uncertain.

From January, 1900, to the present time I can find but

6 cases of successful myomectomy during pregnancy, including the one I am about to report. Doleris reports a large, pedunculated myoma, with recovery. Lewis reports the removal of subperitoneal fibroid, followed by normal delivery. Muir Evans reports the removal of a pedunculated myoma; the case was in the eighth month and doing well when reported. Gemmel reports the removal of 3 myomata in early pregnancy, with delivery at term. Emmet reports the removal of 9 subperitoneal myomata, with delivery at term.

The case which I will report gives the following history:

E. H., aged twenty-eight years, admitted to Nashville Hospital May 3, 1901.

Family history. Father dead; cause unknown. Mother living; has chronic rheumatism. One brother living.

Clinical history. Menstruated at fifteen years; married ten years; sterile. Had always menstruated regularly, and was in good health until January of this year, when she fell from a car and hurt her left side. Missed February, March, and April menstrual periods; has suffered great pain in the left side since; painful urination and defecation. January 30th she claims to have felt mass in the left side.

When admitted she had been confined to bed one week. Great tenderness and pain over the abdomen, exaggerated in the left iliac fossa. Constipated; pulse, 108; respiration, 72; temperature, 99.3° F.

Examination under anæsthesia:

Inspection. Irregular mass in the left lower quadrant of the abdomen; linea niger present; breast plump; secondary areola.

Palpation. Serum expressed from the breast; hard, irregular mass extending to the costal margin in the left axillary line, freely movable laterally and downward; irregular mass in the right lower quadrant of the abdomen, extending to the level of the umbilicus, movable laterally; deep sulcus outlined between the right and left masses.

Percussion. Left lower quadrant dull, except over the colon; left upper quadrant dull in the posterior half, normal

anteriorly; right lower quadrant and right upper quadrant normal.

Auscultation. Negative.

Digital examination. Cervix closed; long, soft, except upon the posterior lip, where there was an apparent slight fibroid condition. No mass in the pelvis; fundus of the uterus not palpable.

Diagnosis. Multiple fibroid with pregnancy, or uterus bicornis with pregnancy.

Operation. Abdomen opened May 6th, which revealed a pregnant uterus at about three and a half months, with two sessile fibroids upon the anterior portion of the fundus. The uterus was grasped with the hands and delivered through the incision, the viscera being protected with flat gauze sponges and the uterus covered with hot, sterile towels.

Enucleation of the smaller tumor (the size of an orange) was now accomplished by making elliptical incisions of the peritoneal covering of the tumor, separation of the peritoneal flaps, and separation of the tumor from its uterine attachment. Considerable hemorrhage was present, which was controlled by deep mural silk sutures. The peritoneal flaps were closed with intestinal silk by continuous suture. The larger tumor (the size of a baby's head) was enucleated in the same manner. The base was larger than anticipated, and in approximating the flaps it was found that approximation could not be accomplished. An area of uterine muscular fibre, two and a half inches by one and a half broad, being exposed. This area being on the anterior surface of the fundus convinced me that, if left exposed, fixation to the anterior abdominal parietes would take place, which would interfere with the ascent of the uterus during pregnancy, and also with subinvolution after delivery.

A bit of omentum was therefore amputated and grafted over the exposed surface. I might state here that the reason for omental amputation was that the omentum was short, and I feared enteroptosis when subinvolution was complete.

The abdomen was closed, the operation consuming one

hour with closure of incision, which extended some two inches above the umbilicus. Patient put to bed in good condition.

Post-operative treatment. The usual post-operative abdominal treatment was carried out, with the following precautionary additions: morphine, $\frac{1}{4}$ grain, and atropine, $\frac{1}{150}$ grain, were given hypodermically one hour after patient came from the operating-room. Chloral hydrate, 10 grains, by rectum, twelve, sixteen, and twenty hours after operation. Morphine, $\frac{1}{4}$ grain, on the following day. Chloral hydrate by rectum, 30 grains, on second and third days, and 10 grains on the fourth day, and morphine, $\frac{1}{4}$ grain, on the sixth and seventh days, to control some suspicious abdominal pains.

Patient made an uninterrupted recovery, and was allowed to sit up at the beginning of the fifth week. At the beginning of the sixth week some abdominal pains, apparently uterine, were exhibited, and she was put to bed and given morphine. These pains were only transient, however, and she was discharged on the beginning of the seventh week in good condition.

Patient was observed during gestation, her condition remaining good.

She declined to return to the hospital for delivery, but went into labor at 5 A.M. on October 15th, and after an uncomplicated and uneventful labor was delivered of a seven-and-a-half-pound girl at 12 M. of the same day. Uterine contraction was good—I might say unusually good. Mother and child both doing well at present time.

The only features in the above which I regard worthy of especial notice are: First, the preference of myomectomy to Porro's operation, or total hysterectomy at all stages of pregnancy, especially before viability of the child; the former has a maternal mortality of 9 per cent., the latter of 20 to 30 per cent.; the former a fœtal mortality of 21 per cent., the latter a complete destruction of the fœtus before viability and a large mortality afterward. The former I regard as

the acme of conservative surgery, the latter the extreme of radical surgery. Second, the careful handling of the uterus and its constant protection with hot towels. Third, the precautionary use of the uterine sedatives in the post-operative treatment.

GUNSHOT WOUNDS OF THE ABDOMEN.

By Wallace Neff, M.D.,
Washington, D. C.

The most discouraging wounds the surgeon is called upon to treat are gunshot wounds of the abdomen. This is due to the fact that a large percentage of the cases have no chance of recovery, either with or without surgical intervention, on account of the nature of the injury inflicted. In the light of the experience in recent wars, a radically different mode of procedure must be followed in military service from that pursued in civil practice. This is due to the opposite conditions that prevail, the chief differences being in the composition and calibre of the bullets, the range, and the physical condition and environment of the patient at the time the injury is produced.

The majority of the wounds of the abdomen now received in warfare are made by the small calibre, hard, steel-mantled, surgically, but not bacteriologically, aseptic bullet of high velocity, flat trajectory, and usually at a range beyond the zone of explosive effect. The men wounded are young, strong, and in the full vigor of health, and, in most instances, have been fasting when the wounds were received. Consequently the alimentary tract is practically empty, the explosive effect of a bullet entering a fluid organ is absent, there is little or no extravasation of the intestinal contents into the abdominal cavity, the danger from shock, peritonitis, and septic infection being thereby greatly lessened. In civil life exactly the opposite conditions obtain. The wounds are made by bullets always infected, of large

calibre, low velocity, and at short range. The force of impact is greater, the apertures larger, shock more severe, and the danger of infection from the skin and clothing greatly enhanced. The physical condition of the patients is usually bad. They are older, and frequently under the influence of alcohol. The alimentary tract is full, the explosive effect marked, and the danger from extravasation of the stomach and intestinal contents, and of hemorrhage largely increased.

Statistics. Alcock states that, before the days of modern surgery, out of 3000 gunshot wounds of the stomach only one recovered.[1] During the Civil War, of 3475 penetrating abdominal wounds, 3031, or 87.2 per cent., died. Not a single case of wound of the small intestine recovered; 59 of the large intestine got well.[2] In the English and French armies in the Crimea the death-rate was 92 per cent. and 91 per cent., respectively.[4] During the Franco-Prussian war the mortality was 76 per cent. In the Greco-Turkish war Dr. Abbott reports 6 cases; 3 were not operated on and died. Of the 3 operated on 2 recovered; the other died.

Colonel Whitehead reports that during the Tirah campaign there were 8 cases; 5 operated on, and all died. The other 3 did not require operation, and recovered.

In our army during 1898, among the regular and volunteer troops there were 56 cases, of which 40 were fatal. During 1899 there were 60, and 41 fatal—a total of 116, and 81 deaths, a mortality of 70 per cent. Of 10 operated on 9 were fatal. Of the 60 cases in 1899, 10 were able to return to duty, and 8 others survived the injury.[4]

The following tables show the statistics in civil life. In Oliver's table of 58 cases, 22 were operated on; 5 recovered and 17 died, or $22\frac{8}{11}$ per cent. recoveries. Of 19 perforating wounds in which laparotomy was done, 2 recovered, or $10\frac{10}{19}$ per cent.[5]

[1] Henry Morris. International Encyclopædia of Surgery, vol. v. p. 512.
[2] Otis and Huntington. Medical and Surgical History of the War of the Rebellion.
[3] Col. Stevenson. British Medical Journal, August, 1899.
[4] Surgeon-General's Report for 1900, p. 297.
[5] J. C. Oliver. Lancet-Clinic, May 7, 1898.

In Grant's table of 253 cases operated on the mortality was 52 per cent.[1]

In Morton's table of 110 laparotomies 62 per cent. died.[2]

Of 107 cases, in each of which a lesion existed, operated on by fifteen different surgeons, there were 66 recoveries and 41 deaths.[3]

Coley gives a mortality, from cases operated on in the first twelve hours, of 53.9 per cent. At a later period, of 77.3 per cent.

Reports of the Anglo-Boer war are incomplete as yet, the most recent and valuable contribution being "Makins' Surgical Experiences in South Africa." His observations are especially interesting and instructive. He found that wounds of the solid viscera proved to be of minor importance when produced by bullets of small calibre. Wounds of the intestinal tract showed themselves capable of spontaneous recovery in a certain proportion of cases, afforded but slight opportunity for surgical skill, and the results deviated but little from those of past experience. Failures were due to the severity of the local injury or to operations being undertaken too late. Many fatalities were due to association with other injuries, especially of the thoracic cavity. Recoveries were limited to wounds caused by bullets of small calibre.

There were a few recoveries from shell wounds of the viscera; none from the Martini-Henry, or large sporting bullet. "The sum of my experience," he says, "was to encourage the belief that unless the intestine was struck in such a direction as to render lateral displacement an impossibility the gut often escaped perforation."

Diagnosis. Such a variety of abdominal wounds may be produced that the following comprehensive classification of Oliver commends itself, and is worthy of general adoption, viz.:[4]

[1] H. H. Grant. Transactions of the Southern Surgical and Gynecological Association, 1899, p. 40.

[2] T. S. Morton. Journal of the American Medical Association, January 4, 1900.

[3] Year-book of Surgery, 1901, p. 83.

[4] Lancet-Clinic, May 7, 1898.

1. Non-penetrating wounds.
2. Penetrating, but not perforating any viscus.
3. Penetrating and perforating some hollow viscus.
4. Penetrating and perforating some solid organ.
5. Penetrating and perforating hollow and solid viscera.
6. Penetrating, with wounds of bloodvessels.
7. Penetrating, with perforation of viscera and bloodvessels.
8. Penetrating, with other serious injuries or diseases.

The first thing to determine is whether we have a penetrating or non-penetrating wound to deal with. If the bullet has traversed the body, and the wounds of entrance and exit are in a direct line, the viscera have necessarily been injured. Exploration of the wound under proper aseptic conditions is the only method of ascertaining whether penetration and perforation have occurred. A probe should never be used. The wound should be enlarged and the finger introduced, rubber gloves being always worn. When a missile traverses the abdominal cavity we may be reasonably certain of having one or both of two grave conditions to deal with : either extravasation of the intestinal contents or a hemorrhage which cannot be controlled except by mechanical means.

Perforating wounds of the stomach, bladder, and intestines are very much alike, the size of the wound depending upon the amount of fluid present. The shape and position of the wound are determined by the course of the bullet, whether longitudinal, transverse, or oblique, to the direction of the intestinal coils. The openings of entrance are a little smaller than those of exit. The bullet usually punches out a piece of the bowel, and even when it strikes at a tangent it makes an opening too large to be plugged by a hernia of mucous membrane or to successfully prevent escape of the contents. Sir William McCormac says : "The bowel is nearly always perforated, feces are extravasated, and very frequently there is some other complication as well."

Perforations may number from one to seventeen, with

recovery. The diagnosis of visceral lesion depends on three symptoms—shock, vomiting, and pain ; not the extent, but the duration of these symptoms. When hemorrhage occurs the patient becomes blanched and pulseless ; very restless, throwing himself about ; sighing respiration ; dulness on percussion on the dependent side, together with all the signs of constitutional shock. The hemorrhage may be due to rupture of one of the solid organs or to laceration of the arteries and veins. It seldom occurs to any extent from vessels of a ruptured intestine. When there is a rupture of the intestine, shock, vomiting, and pain become more marked. If sufficient time elapses before operation, peritonitis develops. The pain becomes more general, and distention, tympanites, and rigidity of the abdominal walls make their appearance. It is impossible to distinguish between tympanites from air free in the abdominal cavity and air still retained in the intestine. The escape of feces or intestinal gas by the external wound is positive proof, but of rare occurrence. If the gas escapes in this way, it does so before the case comes under the observation of the surgeon. Escape of feces is exceptional, and seldom occurs before twenty-four to forty-eight hours. McCormac only saw it in one case in forty-eight, Bernard in three cases out of thirty-six.

Obliteration of liver dulness and blood in the stools are signs of little value in diagnosis. Senn's hydrogen-gas test for perforation consists in inflating the intestinal tube with hydrogen gas from pure zinc and sulphuric acid, collected in a rubber bag holding four gallons. The gas is forced into the rectum by a pressure of two and a half pounds to the square inch—sufficient to overcome the ileo-cæcal valve —and is harmless to the rest of the intestines. If there is no perforation the whole tube from anus to stomach is inflated. If perforation exists the gas escapes and causes free tympanites in the abdominal cavity, or issues through the wound in the parietes.

E. M. Sutton[1] inflates the bowel with ether. The appa-

[1] Journal of the American Medical Association, December 30, 1899.

ratus consists of a rubber tube to insert into the rectum, a bicycle pump, and aspirating bottle in which two grammes of ether are placed. If vapor of ether escapes from the mouth there is no perforation. These methods are useful for purposes of demonstration and to those who are not willing to assume the existence of a visceral lesion on a diagnosis of penetration. Their employment consumes valuable time, and cannot fail to intensify the shock the patient is laboring under.

Treatment. The success in the treatment of gunshot wounds of the abdomen is largely in the hands of whoever sees the case first. In military service it depends upon the prompt application of the first-aid dressing. In civil practice, dirty fingers and probes, lack of a protective dressing to the wound, and the abuse of stimulants are largely responsible for many fatalities.

The treatment is so essentially different in military and civil practice that it should be considered separately.

1. *Military.* An expectant plan of treatment is to be followed. The first-aid dressing, quick and easy transport to a field hospital, absolute rest and quiet, starvation for twenty-four to forty-eight hours. After that hot water in teaspoonful doses, followed by milk. Rectal feeding and stimulation when the lower bowel is not injured.

No morphine, but strychnine and salt solution. If the patient is dying of hemorrhage laparotomy should be made, but never except in desperate cases in a field hospital. It is doubtful if it should be done even then, owing to the *time* required, number of assistants necessary, the absence of proper facilities for doing aseptic work, and the unfavorable atmospheric conditions. A surgeon cannot sacrifice a number of promising cases, where prompt attention is essential to recovery, for one apparently hopeless case, however commendable the effort might be. It is his duty to render "the greatest good to the greatest number." The class of cases that are suitable candidates for operation in a field hospital will probably die, whether operated on or not.

Until the conditions more nearly approach those of civil practice they had better be treated expectantly.

2. *Civil.* An expectant plan is contraindicated in penetrating wounds if seen early and a laparotomy can be made under proper aseptic conditions. In cases of hemorrhage, when large vessels are wounded, prompt surgical intervention offers the only chance of recovery. With the smaller vessels hemorrhage is persistent and profuse into the peritoneal cavity. There is no tendency to the formation of clots in the severed ends of abdominal vessels. This may be due to looseness of the tissues preventing tension by the effused blood in the cut ends of the vessels, or it may be due to the absence of the effect of air. When the abdomen is opened a large amount of extravasated blood is found, even when the vessels are small. Extravasation of intestinal contents will produce peritonitis.

Section is necessary to repair the damaged parts, to cleanse the peritoneum, and prevent peritonitis. Profound shock and collapse are contraindications for operation, or at least it should be delayed until reaction occurs. If due to hemorrhage, an operation must be made, for the patient will not respond to warmth and stimulants, and death will follow if the bleeding is not controlled. If not due to hemorrhage, when the patient recovers from shock examine for penetration. An incision should be made upward and downward from the edge of the wound down to the peritoneum, and explored with the finger—not a probe—rubber gloves being worn. If penetration has occurred, proceed with the operation. In the majority of cases the incision should be made in the median line or a little to one side through one of the recti muscles. The effused blood should be removed and the bleeding points tied. Senn recommends compression of the abdominal aorta as an aid to this end. When the hemorrhage is controlled the wounds in the intestines should be attended to. If one perforation is overlooked, the result may be fatal. Many authorities recommend that the bowel should be examined from the cæcum to the stomach

and to the rectum. The examination should certainly be as complete as the patient's condition will permit. Each perforation should be closed by Lembert or Czerny-Lembert sutures, fine silk and a round needle being employed. Resections are necessary when loss of substance will diminish the calibre of the tube, when there are several perforations close together, and when the mesenteric edge is involved.

When the injuries are within a foot of each other it will reduce the shock and save time to excise that portion of the bowel, and a single enterorrhaphy will then restore its continuity. Suturing at right angles to the long axis of the bowel will prevent a reduction of the calibre of the tube. Complete excisions render the prognosis grave, owing to the length of the operation, increased shock, and the difficulty in making a tight seam.

When an end-to-end anastomosis is necessary and a Murphy's button is not at hand, Maunsell's method is probably the best. Senn's plates and Mayo Robson's decalcified bone bobbins are not as easy of application, are more apt to obstruct the lumen of the bowel and do damage from the necessary handling of the intestine than Murphy's button, which can be employed with rapidity and ease, and is by far the best mechanical means that has yet been devised for the purpose.

When there is contamination of the peritoneum from extravasation of the intestinal contents many authorities recommend irrigation with sterile water or salt solution at a temperature of 105° F. It is far better to employ dry sponging, carefully wiping out the cavity and the bowels, and thus prevent the dissemination of the escaped contents, and avoid providing the necessary moisture for the development of bacilli.

In all cases of perforation of the stomach and intestines, drainage should be employed for at least twenty-four to forty-eight hours.

Lodged bullets should not be searched for unless they give rise to trouble. They can be located by the X-ray

when the patient is convalescent, and removed if necessary.

Prognosis. When the diagnosis of penetration is made the viscera will not escape injury in more than 4 or 5 per cent. of the wounds. The death-rate is about 90 per cent. in cases not treated by laparotomy.

After twelve hours the chances are against recovery. After twenty-four to forty-eight hours the case is almost hopeless. When peritonitis is developed the apertures in the intestine or viscus may not be found, and if found the tissues will not stand suturing. If the alimentary canal is perforated, injuries in certain segments, even if perforated by small calibre bullets, may recover spontaneously.

The prognosis is best in the following order: Ascending colon, rectum, stomach, sigmoid flexure, descending colon, transverse colon, and small intestine. Spontaneous recovery is very rare in perforating wounds of the transverse colon and small intestine. Wounds of the solid viscera usually heal spontaneously, and give no trouble unless great vessels are injured. This includes all organs except the pancreas. Wounds of the kidney are the least likely to give trouble; wounds of the bladder, if in the intraperitoneal segment, often heal spontaneously.

These favorable results are due only to small calibre bullets. The prognosis in injuries of the viscera depends upon co-existing injury to other organs, especially of the thorax, which is quite common.

Conclusions. 1. *In military service* in the field an expectant plan of treatment promises the best results. This is due to the small calibre bullet, long range, and prompt use of the first-aid dressing.

2. Expectant treatment is necessary, owing to the climatic conditions, the absence of the proper facilities for doing aseptic work, and for carrying out the after-treatment, and the inability of the surgeon to devote the *time* necessary to apparently hopeless cases.

3. *In civil practice*, laparotomy is indicated. When in doubt as to penetration, make an exploratory incision. When hemorrhage is suspected, or multiple injuries of the viscera possible, operate immediately.

4. The good results in civil practice are due to prompt surgical intervention.

5. If the conditions were reversed, and the wounds in warfare could be treated in the field as they are in civil hospitals, there would doubtless be a larger percentage of recoveries. On the other hand, if the wounds in military practice were of the variety found in civil life, there would be few, if any, recoveries from an expectant plan of treatment.

PUERPERAL SEPSIS: ITS PATHOLOGY AND TREATMENT.

By William R. Pryor, M.D.,
New York City.

It is hardly possible that in the time allotted me I can give a description of the many and minute changes wrought in the system by puerperal sepsis or discuss all the various methods of treatment; still I can call your attention to certain of the more recent investigations into the pathogenesis of puerperal sepsis, and perhaps bring out a discussion regarding the treatment which may be of value to us all.

The manner in which women become infected is of interest to us all. It is a comforting belief that auto-infection may take place, but the observations of Krönig and Whitridge Williams pretty thoroughly disprove the possibility of this, except in very, very rare instances. An infecting coitus may take place just previous to delivery as well as may an infecting examination, but such is not auto-infection. About 49 per cent. of prostitutes have the gonococcus present, though latent, in the cervical glands, and a small percentage of honest married women have the same. In such, of course, self-infection by the gonococcus after delivery is possible. Lastly, a few women with a pus focus in one or the other adnexa will conceive and go to full term, and become infected by this after delivery. But this must be very rare, because such a lesion supposes sterility or induces early abortion. We are, therefore, forced to believe that puerperal sepsis is caused by germs which are introduced from without.

Causes. Franz, the most recent writer on this subject, found the gonococcus present in but 4 per cent. of his fifty

cases of puerperal fever ; once in a mild case accompanied by saprophytes, and once in a severe case with streptococci. The degee of infection produced by the gonococcus is mild. In 300 cases of afebrile puerpera, nine observers found some sort of germ in 27 per cent., but never the streptococcus or pyogenic staphylococcus. In a very few cases of mild form streptococci are found, but in nearly all cases of infection by pyogenes streptococci and staphylococci the symptoms are grave. We are, therefore, warranted in asserting that puerperal sepsis is caused by streptococci and staphylococci ; but in most cases these are accompanied by other germs, especially saprophytes.

Lesions Produced. Upon entering the uterus these germs soon penetrate deep into the decidua, through the endometrium and enter the lymph channels of the uterus. From there they pass into the venous sinuses and into the lymphatics of the pelvis, thus entering the general venous and lymphatic systems. The peritoneum over the uterus and lymphatics may become inflamed, pouring out serum, lymph or pus. Septic emboli may break from the thrombi in the ovarian or iliac veins and produce septic infarcts elsewhere. Septic pneumonia, septic endocarditis, acute nephritis, and general suppurative peritonitis are some of the graver lesions induced, while ovarian abscess and pyosalpinx are local results. Viewed in the light of the lesions resulting, we may divide puerperal sepsis into septic thrombosis and pelvic lymphangitis. We may also describe as puerperal any septic condition occurring after abortion where the induced lesions are such as we see follow full-term labor. The most rapidly fatal cases are the thrombotic.

The havoc wrought by the infection is governed by a great many factors. Chief among these is the virulence of the infecting germs. Then the traumatism to which the uterus has been subjected, the patient's general condition and the area of endometrium invaded, all influence the result.

Unlike saprophytic or putrid infection, which tends to spontaneous recovery, puerperal sepsis, if not rapidly fatal,

almost always produces lesions which seriously damage either a pelvic organ or some other viscus. I wish this fact to be borne in mind when we consider the treatment. *Time* is here an important element. Therefore, our treatment is governed not only by the mortality figures but also by the morbidity.

Regarding the virulence of the germs in different localities we notice that while Krönig and Whitridge Williams in their cases had a mortality of about 5 per cent., Edgar Macharg in fifty-seven cases had 54 per cent. mortality. And those who will recall the epidemic here of 1881 will remember the great number who died.

The danger from saprophytic infection being so slight and its correction so easy, while the danger from streptococcus infection is great and the best method of dealing with it in dispute, the importance of an accurate diagnosis is apparent.

The best way to secure uncontaminated the uterine lochia is by means of a Döderlein tube, which is passed, after sterilization, into the uterus and without touching the vulva or vagina. Even here there is a leak in the technique, for the cervical glands may soil the tube, but will hardly get into the lochia which is sucked up from the fundal cavity.

Treatment. Having found pyogenic cocci how shall we proceed to treat the case? The most popular method of treatment is by intermittent washing. This is what Macharg did and lost 54 per cent. of his cases. Besides, the cocci not being on the surface, but deep in the uterine walls, washing cannot and does not reach them. All it succeeds in doing is to add to the distress by inflicting additional and needless trauma. The gentlemen who laud washing have not made bacteriological examinations of their patient's discharges, and they can rest assured that where they see benefit from the treatment it is not in streptococcus cases, but those of saprophytic nature. And even in these they have subjected their patients to needless danger by improperly performed manœuvres, for it is too easy to convert a saprophytic infection into a septic.

Curettage of the septic uterus gives a prohibitive mortality ; and again we must condemn a measure in sepsis which is of benefit in saprophytic infection.

Serum Therapy. The commission appointed by the American Gynecological Society, of which I have the honor to be a member, reported in 1898 that Marmorek's serum where used in 101 cases of streptococcus puerperal fever gave a mortality of 33 per cent. Of course, if used in cases showing no streptococci the mortality is less, but we do not believe the advocates of the serum claim it is efficacious against any germ but the streptococcus, and in streptococcus infection the mortality is 33 per cent.

We have found that the serum was used in 251 cases where no bacteriological diagnosis was made, and gave a mortality of 16 per cent. Now, as Williams found the streptococcus in but 25 per cent. of his cases of puerperal fever, Krönig in 19 per cent. of his, Franz in 26 per cent. of his, we can assume that of these 251 cases about one-quarter were streptococci ; and as the other 75 per cent. would have lived if left alone, the serum here was followed by forty deaths in 63 cases, or 63 per cent. mortality. If we could only know the kind of streptococcus a given serum was prepared from, and could secure a case infected by, just that identical streptococcus, we might secure better results from its use ; but as our knowledge of streptococci now stands the administration of antistreptococcus serum is followed by a mortality which prohibits its use.

Fortunately, in taking from the man who occasionally sees a case of puerperal fever this much-lauded remedy we have other methods of treatment to offer which are more efficacious.

These septic cases are to be considered in two classes. The cases of thrombosis are comparatively rare. When the diagnosis can be made my belief is that no form of treatment will prove effective short of an abdominal hysterectomy, preceded by intravenous infusion, and rapidly performed. Inasmuch as here as well as in pure pelvic lymphangitis the

peritoneum and lymph streams are involved, I would suggest the use of a large abdominal Mikulicz dressing of iodoform gauze. But this is the only form of puerperal sepsis in which I would perform hysterectomy.

How are we to treat the more common cases of septic pelvic lymphangitis, the usual puerperal sepsis?

Krönig, basing his practice upon fifty-six cases of sepsis, lost 4 per cent., employing a general supporting treatment only.

Whitridge Williams in twenty-three cases treated in a similar manner lost 4.35 per cent. So the general practitioner has good ground for refusing to listen to the gynecologist when he advises operation. But I for one cannot forget the mortality which attended exactly the same treatment in olden days, emphasized as they are by Macharg's recent figures. I must believe that the infecting germs in Williams and Krönig's cases were weak and not virulent. But even granting all they say as to mortality, the unchecked sepsis must have wrought havoc, not only with the pelvic organs, but also with the general health. I cannot see the logic of their position, and must believe that these gentlemen, for whose scientific attainments I have the greatest respect, have been unduly attracted by the seductively low mortality. At the time when Williams reported his cases I gave a list of fourteen cases in which I had operated, one when she was dying with endocarditis and nephritis, with this one death. To show how completely these women recovered, two have since been reported as pregnant. The method I have adopted since 1894 has proceeded along these lines: I have attempted to check the local infection and to combat the general septicæmia. Incidentally also I wish to prevent pelvic suppuration.

I curette the uterus as thoroughly as possible, being careful to wash out all débris with this tube, using many quarts of normal salt solution. The material removed by the curette is placed in a sterile jar for examination. I then pack the uterus full of 5 per cent. iodoform gauze.

The next step is to make a broad incision into the posterior cul-de-sac. Through this I evacuate all fluids in the pelvis. In most cases there is much serum present, some lymph and often pus free in the pelvis. Any false union between the organs is broken and the pelvis is wiped dry. I now make what I call the pelvic Mikulicz dressing of iodoform gauze. This dressing completely fills the pelvis and is in close apposition to all the pelvic peritoneum to the pelvic brim, except in front of the uterus. The iodoform is soon broken up by the serum, and so rapid is its absorption that it appears in the urine from two to five hours after the operation.

The circulation of so large an amount of this powerful antiseptic in the blood must have a deterrent effect upon the general sepsis, as these charts will show.

To determine whether the streptococci which I found in the uterus and in the pelvic cavity were destroyed, I instituted with Dr. Jeffries, bacteriologist to several of our institutions, a series of investigations. We found that invariably all cocci were destroyed, streptococci remaining to the third dressing in only one case, and she has since reported pregnant.

If under ether I find the pulse 120 or over, or if there are grave visceral lesions elsewhere, particularly in the heart and kidneys, I always do an intravenous saline infusion of from two to three quarts. This seems a severe measure, but all the cases brought to me are in bad shape and most of them have nephritis. The essence of the treatment is local and general iodism, together with promotion of the function of the kidneys.

After operation I use colon enemata of salt solution every three hours, for the purpose of eliminating the toxins and the iodine. This treatment has been employed over fifty times by myself and associates. By means of it I feel sure we have saved women who otherwise would have died. While the procedure is novel to some of you, and while it is based upon a new principle, namely, the introduction into

the blood of so powerful an antiseptic as iodine, which would appear dangerous, I can but be governed by what we have seen. Such is the position of our present knowledge regarding the puerperal sepsis.

Repeated irrigations we find do harm. Curettage gives 20 per cent. mortality. Serum therapy gives 33 per cent. mortality. We have, coming from great men, the conclusion that it is best to do nothing in an operative way. You may elect to accept that advice. But what will you do if their further experience prompts them to desert you? If you are now so disposed as to follow me and many others, perform a rapid abdominal hysterectomy in your cases of thrombosis, and in the cases of true puerperal sepsis the curettage and cul-de-sac operations as I have described it.

GASTROSTOMY AND RETROGRADE DILATATION IN IMPERMEABLE BENIGN TRAUMATIC STRICTURE OF THE ŒSOPHAGUS, AND INTERNAL ŒSOPHAGOTOMY BY THE ABBE SAW-STRING METHOD.

By Hugh M. Taylor, M.D.,
Richmond, Va.

Two years ago the little patient who is the subject of this paper drank concentrated lye. In spite of persistent efforts to prevent it, a progressive stenosis of the œsophagus, with the usual symptoms and consequences, resulted.

For six or eight months prior to the time at which he came under my care he had had the intelligent services of Dr. John Dunn, and long since the date of his accident he had been under the treatment of one or more good physicians. For months Dr. Dunn had tried to stretch the stricture with bougies through the mouth. Finally, if not from the first, Dr. Dunn realized that the stricture was impermeable and did not belong to that class of cases which can uniformly be treated by direct dilatation. In spite of rectal alimentation, which was begun early to supplement what little food possibly passed through the narrowed œsophagus, the child lost flesh and strength rapidly. At the time of his admission into the Virginia Hospital apparently every drop of fluid taken by the mouth was promptly regurgitated from the dilated œsophagus. A more pitiable looking little creature is rarely seen—a child of six years of age weighing but sixteen pounds, whose suffering from hunger and thirst was distressing in the extreme.

A gastrostomy, with the dual mission of an internal œsophagotomy and retrograde dilatation and feeding through the gastric fistula, was thought clearly indicated. By measuring with a bougie passed down to the stricture its site was shown to be in the lower part of the œsophagus. It was evidently below the arch of the aorta, and this fact rendered an external œsophagotomy impracticable. Mayo and Gussenbauer have both recently urged the advantages of external œsophagotomy for dense strictures above the arch of the aorta; but unfortunately, as in this case, a majority of dense strictures are low in the œsophagus. The poor little starving creature was in a sad plight to stand the anæsthetic and the prolonged surgical intervention. Several times during the operation it was thought he would not live until its completion.

Upon opening the abdomen and stomach we found we were able to dilate the cardiac orifice of the œsophagus sufficiently to introduce one finger, but about an inch above this orifice the œsophageal tube seemed to be completely obliterated. A stout pointed whalebone bougie passed down from above seemed at least an inch from the finger in the œsophagus below. Apparently the tube was obliterated for an inch. Neither from above nor below could the smallest bougie or probe be passed, and of course no dilatation, direct or retrograde, could be accomplished. After persistent and gentle efforts it was determined to make an opening through the obliterated portion of the tube by force. Accordingly a pointed whalebone bougie was shoved from above, and being guided by the finger below it was safely made to emerge into the stomach and out through the abdominal incision. To the end of the bougie a stout piece of silk was secured and easily withdrawn through the mouth with the bougie. An effort was then made to saw the stretched cicatricial tissue with the silk. Apparently we did not at first succeed with it as well as we had anticipated. Several efforts or repetitions of the sawing were necessary before a satisfactorily large bougie could be passed. Finally, partly as a

result of the sawing and equally as much by the dangerous amount of force used in passing the bougies, the tract was sufficiently opened. We did not, as is advised by some, do an external œsophagotomy through which to bring the proximal end of the string. The weakened condition of the boy did not warrant that much added trauma, even if such a procedure would have afforded decided advantages in the sawing movements. It was deemed wisest in this instance to perform a gastrostomy. We were by no means sure that we would not need the gastric opening for future retrograde dilatation, and certainly in his depressed condition the boy needed this new route for the introduction of food. This last conclusion is duly impressed by Bryant[1] in the following words: "The enfeebled condition of many of the patients with œsophageal stricture from lack of nourishment, and the tendency of obstinate strictures to relax after a longer or shorter quiescence of the tube, have led to increased frequency of employment of the latter (gastrostomy), in order to permit of ample and immediate nutrition and to afford the rest to the œsophagus essential to stricture relaxation." It would naturally occur, if we have the stricture opened sufficiently wide to introduce a bougie from above, it should be the case that we could introduce certainly fluid food, in which event a gastrotomy followed by an immediate gastrorrhaphy was all that was needed. We had the experience to guide us that Dr. Dunn, in spite of his best efforts, had failed to keep the stricture patent. The œsophagus above the stricture was very greatly dilated—certainly it was very irritable and inflamed—and of the number of false passages existing of course we could not know; and, as we have mentioned, it is impressed that the rest to this inflamed area, secured through the means of a gastrostomy, induces a marked lessening of irritation and inflammation. It naturally renders the passage of food and dilating instruments very much less difficult. It was also deemed advisable to leave the silk

[1] Operative Surgery, vol. ii. p. 604.

thread *in situ*, certainly for a time. One end was brought out of the mouth and fastened by a bit of adhesive plaster to the cheek, and the other secured in the same way outside of the gastric fistula. Our idea in leaving the silk was to use it again if needed to saw the stricture, or possibly to guide a dilating instrument through the stricture either from above, direct, or from below retrograde.

In view of the fact that we expected to have to use the gastric fistula as a route to reach and stretch the stricture it was deemed best to have a straight tract through the abdominal wall. Obviously the Ssabanajew-Frank nor the Witzel method would secure this desideratum. The method adopted was that relied upon by Dr. E. J. Senn: "The basis of action of this method is the formation from the walls of the stomach of a circular, valve-like structure near the surface, which readily permits of the introduction of food, yet aims to prevent the escape of fluid at all times."

The great advantages incident to the Ssabanajew-Frank and Witzel method were well illustrated in the after-treatment of this case. Leaking was incessant. Food, as fast as it was introduced into the stomach, either through the mouth or the gastric fistula, was at once pumped back through the fistula by the action of the diaphragm. The bad effects of direct attachment of the stomach wall to the abdominal wall were very noticeable. The child was starving almost as surely with two openings into the stomach as was the case when he had one. This was the case in spite of the fact that the opening in the stomach had been made as high as possible on its anterior wall. A device was finally secured which was very satisfactory in preventing leaking. It was an infant's elastic rubber umbilical hernia truss. An elastic bulb which could be distended with air or water made efficient pressure over the orifice of the gastric fistula. For a week or ten days the child was fed through the gastric fistula for the purpose of giving the œsophagus rest. It was then found that he could swallow fluid food readily, and a good-sized

bougie was passed with but little difficulty. From this time on his convalescence was uninterrupted.

In the space of several months he has gained in weight from sixteen to forty pounds. The truss has been worn over the fistula constantly, and a few weeks ago it was noticed that it had healed spontaneously. Dr. Dunn is kind enough to continue to look after the dilatation. Deglutition seems not to be interfered with to any appreciable extent, and solids as well as fluids pass readily. At times bougies are passed with ease, but at other times a very noticeable spasm calls for some patience before the attempt is successful.

A concise and logical summary of the treatment of this type of œsophageal strictures has recently been formulated by Mayo :[1]

"1. Systematic sounding should be commenced in from two to four weeks after the swallowing of a caustic substance. 2. Should the trumatism be severe immediate gastrostomy will lessen infection and hasten cicatrization, sounding being carried on as before. 3. Non-dilatable strictures in the vicinity of the cricoid cartilage should be divided by external œsophagotomy. 4. Strictures above the arch of the aorta may be safely cut by a combined internal and external œsophagotomy. 5. Dense thoracic strictures are best dilated by Oschner's method, and, if necessary, divided by Abbe's string-saw. 6. Impassable strictures should be treated by retrograde dilatation. 7. A dilated stricture should be occasionally sounded for years, if not for life."

Tillman also advises gastrostomy for feeding purposes in the primary stages, obviously to lessen irritation, and ulceration, to hasten cicatrization, and minimize inanition.

After my experience with this case I would like to emphasize one idea which has been so often impressed, and that is that operative intervention in such cases is too often delayed until the patient is in no condition to stand it.

[1] American Year Book of Medicine and Surgery, 1901.

THE TIME FOR OPERATION IN APPENDICITIS.

By A. M. Cartledge, M.D.,
Louisville, Ky.

Contrary to the general opinion, surgeons engaged in active practice must still maintain that there does not exist a clear appreciation of this subject in the minds of many practitioners of medicine. Indeed, surgeons are not in accord upon this most important question. There are those with some authority who advise without qualification that cases of appendicitis should be operated upon when first seen and recognized, regardless of the stage of the disease. There are others who would treat all acute cases by the expectant plan, nursing them through the attack and subjecting them to operation after the subsidence of inflammatory symptoms, or carry them to the operative period, where it is well known the risks are very slight indeed. There are still others who attempt to save the patient the dangers incident to going through an attack of appendicitis, provided they see him early enough to subject him to operation, and if this cannot be done on account of the case having progressed well into the localized inflammatory state by means of diet and nursing, await a time more suitable for operation after the disease has subsided.

I have long since come to the conclusion that this mass of contrary evidence bearing upon such an important subject does little harm as applied to men with large operative experience in appendicitis, for the simple reason that an enlarged experience has taught them discrimination, and, as a matter of fact, many of them do not operate in practice upon cases that their written and spoken directions would indicate.

The case is, however, very different when applied to men who have had little operative experience in this disease. Cer-

tainly, we know that to operate upon cases of acute appendicitis after the fourth or fifth day is oftentimes a procedure attended with graver dangers to the patient than an expectant line of action. Now, to follow the rule of operating on every case as soon as the diagnosis is made might apply to this very case diagnosed for the first time on the fifth day.

Again, no one with experience in this disease could doubt the wisdom of operation in just such a case if seen prior to the formation of adhesions and the absorption of septic matter, namely, as in the first twenty-four hours after the onset of symptoms. Operations performed at this time fulfil the same purpose as operations in the interval, namely, they save the patient the dangers of an attack of appendicitis which may terminate in recovery, a slow pus infection, or death from general septic peritonitis.

I believe it may be safely stated that the profession is now about unanimous in declaring in favor of very early and very late operations, the latter being designated operation in the interval between attacks. Unquestionably the point to decide as regards the time of operation applies directly to the rather large class of cases seen for the first time after three or four days have elapsed. These cases should be studied in a separate category to themselves, as they furnish the only ones where the propriety of operation may be in doubt. That many, in fact the majority, of such cases do better without operation than with it there seems to be little reasonable doubt. They have passed from a safe operable stage into a condition where an operation is often more hazardous than the processes of nature. The truth is that no man has a right, if it is in his power to decide otherwise, to permit a patient to go on to this questionable state where operation is of doubtful utility. To wait in a case of acute appendicitis to see if the case will be severe enough to demand operation is the height of folly, in view of the fact that it is impossible to tell the outcome of any case, and that by immediate action, if the case is seen early, we avoid all the dangers incident to the disease. I believe that patients living three days after an attack of appendicitis and not hopelessly the subjects of general peritonitis promise

a good prospect of getting over that attack of the disease. This very fact has led to the fallacy of many medical men claiming that the results of treatment by medicine were as good as those of surgery, the surgeon, by his misconception of the proper time to operate, contributing to this fallacious view. We should be firmly impressed with the idea that the patients who die from acute appendicitis, and they are very numerous, are killed as a rule within the first fifty hours of the disease; that is to say, their fate is decided, with rare exceptions, as regards that attack.

A few years ago it was a practice among physicians, and is still in many quarters, to watch the case for two or three days, and if the symptoms were growing more severe, fever greater, etc., to call in a surgeon, who, following the advice so prevalent at this time of operating as soon as the case was first seen, plunged in, tore up adhesions, frequently scattered infectious pus, and embarrassed kidneys by anæsthesia that had all they could do to eliminate toxins of the systemic infections. Consequently the mortality was high—certainly at that time much higher than the same case seen at the same time and under the same circumstances would have been if left to nature and treated by a low diet and bodily quiet. It is not surprising that observant physicians soon were out with statements in the journals to the effect that more of their cases of appendicitis got well when not operated upon than when operated upon, the surgeon's misconception of the proper time for operation being the chief cause of this very sensible deduction upon the part of the practitioner.

Now, the present paper would not be written but for two reasons. First, there are still general practitioners who believe, or claim to believe, that more cases of appendicitis recover without than with operation, and, second, there are some surgeons who operate upon every case of appendicitis seen, regardless of the stage of the disease or the local or general condition; possibly and reluctantly exempting moribund cases from general peritonitis.

If the physician and surgeon could adopt a simple line of practice based upon the time the patient is seen, or, in other

words, stage of the disease, and the condition of the patient, the beneficence of surgical treatment in this affection can scarcely be exaggerated.

I appreciate the fact that hard-and-fast lines cannot be laid down, but a working rule is not as difficult as one would at first suppose.

These thoughts have been suggested by the fact that, strange to say, this question is still being discussed from several stand-points. Men occupying authoritative positions have made statements which it seems they have not seen fit to retract, and the pernicious effects of these statements still exist and manifest themselves in the work of surgeons of limited experience, and I believe this is the reason that, in certain quarters, the operation for acute appendicitis is in disrepute. There is no distinction made.

I cannot at this time go at length into a discussion of the operation in cases of the fourth or fifth day; sufficient to say that quite a while ago—and I was among the earlier people calling attention to this—I became convinced that there was something wrong in the contrary statements that appeared between the general practitioner and the surgeon, that there was a misunderstanding somewhere. I finally realized that both were right, but they were looking at the thing from entirely different stand-points. The surgeon, and I was among the number at that time, rarely operated on a case of appendicitis before the fourth day. The teaching was to wait and see whether the patient had such and such a pulse, if certain things eventuated the patient would probably get over the attack; but if the patient grew worse he would operate. That plunged us into that stage of the disease about the fifth day, when the patient had a coated tongue, a bounding pulse, deficient urinary secretion, in other words, was septic generally, but probably not a general peritonitis, with severe localized inflammatory processes going on, when all the conditions of the patient were bad, and we have never appreciated why numbers of these patients were carried off two or three days after the operation. We scrubbed them, broke up extensive intestinal adhesions, we packed them with gauze, and

a number of them died. It is true the technique was not as good as it is now; it is true that men frequently doing the work were not as competent as men are now who have operated numbers of times, and the mortality was steady; it is steady yet; nobody has been able to entirely wipe it out in these cases. We may report one hundred or even three hundred cases of appendicitis to-day operated upon without a death, but in doing this we cannot make such report in cases operated upon between the fourth and seventh day of the disease. Nobody has been able to do this. It was a notorious fact that these patients seemed to get well after the formation of a tumor. Soon I recognized that a case of appendicitis that died did so in the initial stage. By operating upon these patients during the third or fourth day of the disease we take more risks than we do by the expectant plan of treatment. I have seen a considerable number of late cases, and have seen but two die from rupture of the abscess, showing that this danger is little to be dreaded. There are some few cases, but they are rare, in which there is an exaggerated sepsis, burrowing of the pus behind the colon or up under the liver, still I have always contended that the abscess could be made out and relieved before the patient gets into fatal sepsis. Patients that die from acute appendicitis, with but few exceptions die from injuries sustained in the first forty-eight hours of the disease, from rupture before adhesions have formed. If we do not perform a very early operation, if the patient is still living at the end of the third or fourth day, in the majority of cases if you will treat that patient by rest in bed, low diet and the administration of proper remedies to improve his condition, and then operate upon him later, you will find that the mortality will be reduced to about 5 per cent. or less against 18 or 20 per cent. under the old method. Since I have followed the present plan my results have completely changed in this disease. I make it a steady rule, to which there are but occasional exceptions, for instance, where the case is very mild on the fifth or sixth day, a few adhesions, a low temperature, etc., I do not let that patient wait, but operate upon him; but when a case presents with a considerably swollen abdomen,

with circumscribed peritonitis, five days having elapsed, temperature from 101° to 103° F., the abscess is well walled off, and I do not think of operating upon him at that time, but put him on a low diet and keep him absolutely quiet. After the subsidence of the acute symptoms I have a patient who is a better subject for operation. With this amount of discrimination, by watching the case carefully, avoiding operation upon patients in that acute septic stage, I do not see much general peritonitis, waiting until that time has passed, until nature has walled in the abscess and taken care of the acute sepsis. I say by this amount of discrimination we have made the greatest difference in our results. I do not mean this as a matter of clap-trap, but we have had only one death in I think 157 cases of appendicitis operated upon in the last three years, and these were not all interval cases; we have operated on a number of acute cases, and the patient we lost died from acute meningitis.

My views upon general peritonitis cases are well known. I ceased to operate upon such cases long ago. I operated upon about thirty such patients with 100 per cent. of deaths. Those cases in which I put my ear over the abdomen and cannot hear a single sound, the abdomen perfectly dead, with a pulse of 130 or over, I know they will not live if opened, therefore I do not now operate; formerly I opened them. We cannot save such people, and it is not necessary to operate upon them and take the chance. We have operated upon borderline cases where there seemed to be moderate peritonitis, where rupture had taken place as early as the thirtieth hour. They have been saved by properly washing and sometimes draining the peritoneal cavity. I claim that in these cases we avoided general septic peritonitis, it had not become general, otherwise our patients would have died from paresis of the bowel. We must use discrimination in these cases, early operation in appendicitis cases is just as much preventive of disaster as late operation is. The late operation is intended to prevent future attacks; very early operation is intended to save the patient from the dangers of the immediate attack. It is a serious thing to strip up and denude all of the bowel

around an appendicitis abscess. Many of these patients die of obstruction of the bowels where they do not die of peritonitis. I can remember a number of them where I plowed among the adhesions, stripped the peritoneum off several feet of the bowel and stuffed them with miserable gauze. I rarely do this now; it usually means that we do surgery at a time when it ought not to be done, in pus-tubes as well as in appendicitis. A large number of them die from obstruction of the bowels. As a rule, nature would have taken care of them better. I would rather wait and take the chances of the adhesions melting down.

I know there is opposition to the views I have expressed, but our practice has thoroughly borne out what I have stated. I have gone through our records for the last three years, and found but three cases that died without being operated upon. So that we do not lose them by denying them the last chance. Time and again we have refused to operate upon patients, carrying them over until the acute stage had passed and until they were in proper condition to withstand the operation.

The time, then, for operation in appendicitis, with some exceptions, is very early and very late in the disease, avoiding the mid-time.

THE PROSTATE.

By John D. Murphy, M.D.,
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In the very recent literature the surgery of the prostate has been given a much-deserved prominence. The patience and long suffering of those with prostatic trouble is unnecessary to mention as an incentive to active investigation in this particular field. We believe that the recent procedures have been sufficiently tried to justify their regular performance, and that they give us reasonable assurance of safety to the patient and permanency of relief. It appears to us that it is now a matter of improvement of technique in the operations and a dissemination among the general profession of the importance of the early performance of operative procedures that are most needed.

Before citing cases the author takes the liberty of considering the anatomy and physiology of the prostate, as well as etiology and pathology of prostatic hypertrophy.

Anatomy. The prostate is a glandular and muscular body situated in front of the bladder, entirely behind the triangular ligament or deep perineal fascia (see Fig. 1, from Toldt), immediately anterior to and in close contact with the rectum, and completely surrounding the prostatic urethra. It is tunnelled by the prostatic urethra, the urethra occupying the second anterior fifth of the space from before backward.

Five-sixths of the bulk of the normal prostate is behind the posterior level of the urethra. (See Figs. 2 and 3.) Its greatest fixation is by its attachment to the posterior layer of the triangular ligament. When the ligament is divided, therefore, and the prostate freed from it, it permits of considerable latitude of motion. On the anterior surface it is rather loosely attached to the urethra; on the posterior surface it is firmly

fixed to the urethra ; the mucous lining of its glands and of the ejaculatory ducts and prostatic sinuses are continuations of the mucosa of the urethra (see Fig. 4), so that it is not possible to remove the entire prostate without removing the prostatic portion of the urethra at the verumontanum. (See Fig. 2, from Toldt.) It is possible to remove the lateral and posterior lobes of a hypertrophied prostate, allowing its isthmus to remain, and retain the anterior portion of the urethra and three-fourths of its circumference. (See Fig. 5, from Toldt.) The anterior urethra is crescent-shaped, its convexity forward; the posterior surface of the urethra vaults forward into this crescent, the elevation being made up of the canaliculus, utriculus, ductus ejaculatorii and the connective tissue surrounding them (see Fig. 5) and the middle lobe behind as shown in Fig. 6.

The middle lobe in the normal anatomical condition is a small bullet-shaped, tongue-like projection from the base of the prostate, posterior to the urethra. It is not a lobe when compared to the lateral lobes; it is merely a projection in the direction of the bladder from the posterior commissure, between the lateral lobes; and when the lateral lobes and posterior commissure are removed it is practically detached except from the mucosa, as shown in Case VII.

The gland is surrounded by a distinct capsule (Fig. 5), which is smooth over the lateral lobes, but is depressed into the gland and divided into layers around the vessels in the median line. This vascular area runs parallel with the urethra and directly in the centre line. Capsular divisions, therefore, in the removal of the gland should be made over the lateral lobes and parallel with the line of the urethra, that this vascular area may not be invaded until the lateral lobes are decapsulated and prepared for extirpation, and the hemorrhage thus avoided. The seminal vesicles recede from the prostate (see Figs 3 and 4) along the posterior wall of the bladder and are closely attached to it.

The vesicorectal peritoneum is a long distance from the base of the prostate, and in subcapsular enucleation its integrity is not in danger of being disturbed.

The arterial supply of the prostate is from the inferior vesical and middle hemorrhoidal arteries. These are subdivided at the inner margin of the capsule into small arterioles, and when the true capsule is peeled off they give rise to little hemorrhage. The veins which form a plexus in the capsule empty into the vesicoprostatic plexus.

The lymphatic supply is meagre; the vessels accompany the venous plexus, and finally end in the internal iliac nodes. The nerves of the prostate are branches of the hypogastric plexus.

In its minute structure the organ is made up of a stroma of connective tissue, smooth muscular fibres and glandular tissue. (See Fig. 5.) The muscle fibres constitute about one-half of the entire mass of the gland (see Fig. 5), and are continuous with the muscle fibres of the bladder wall above; below they are mingled with a small amount of voluntary muscular tissue derived from the transverse perineal muscles. (F. H. Gerrish.)

The glands are of the branched or tubular variety. They secrete a milky fluid, which at the moment of ejaculation is added to the seminal fluid, and appears to play an important rôle in the motility of the spermatozoa, as without the addition of this fluid, in some of the lower animals, fecundity cannot take place.

While in its normal anatomical position the prostate stands in front of the bladder and surrounds the urethra (see Fig. 2), in its hypertrophied condition it has an entirely different relation to the bladder. It normally extends backward onto the bladder only to the sphincter vesicæ internus (see Fig. 7), which shows the bladder wall with prostate removed. In its pathological or hypertrophied condition it encapsulates the neck of the bladder in a cuff-like manner, extending many inches upward on its wall, and often protrudes into the vesical cavity, carrying on its surface the muscularis and mucosa vesicæ; occasionally a pedunculated lobe may be extended through the muscularis and only retain the mucous covering; this, however, rarely occurs except from the posterior lobe. In the normal anatomical condition the muscular fibres of the prostate are continuous with the muscular fibres of the apex of the

bladder wall, but as the prostate enlarges it extends cone-shaped and upward on and around the neck of the bladder, and its muscle fibres in the upper part appear to be distinctly separate, or at least easily separated from the muscle fibres of the bladder. This anatomical relation gives distinct assistance and guidance as to the best method of removal or separation of the prostate from the bladder wall—*i. e.*, at the extreme apex of the bladder it would be difficult to distinguish between the prostatic and bladder muscular fibres, while, if the base of the prostate be exposed, the prostate can be shelled from the bladder wall, from above downward, with ease and with comparative safety to the integrity of the bladder wall—*i. e.*, if we look upon the prostate as a cuff, closely attached at its apex to the bladder wall, and loosely attached at its base, we can see how its lateral lobes can be scrolled or rolled forward with ease with the assistance of hook retractors, until it reaches the apex attachment, as shown in Fig. 8.

Physiology. "At the cervix of the bladder the circular layer of muscular fibres is strengthened and has been supposed to act as a sphincter with regard to the urethral orifice; it is called 'sphincter vesicæ internus' (at point *a*, Fig. 7). Around the urethra just outside the bladder is a circular layer of striated muscle, which is frequently designated as the external sphincter or sphincter urethræ."—*American Text-Book of Physiology*, 1896.

When the urine accumulates in the bladder, to prevent its escape the elasticity of the parts, aided by the tonic contraction of the internal sphincter, suffice. This function of the circular layer of fibres, which composes the internal sphincter, is disputed by some observers. That this sphincter controls absolutely the flow of urine I have demonstrated conclusively on three of my cases after the prostate was removed, and the posterior prostatic urethra entirely removed with it. It was necessary in these cases to introduce a forceps or a catheter to allow the urine to escape from the bladder when the operation was complete, showing that the sphincter vesicæ internus has complete control of the urine without the aid of the sphincter urethræ, notwithstanding the statements of so many authorities

to the contrary. "When the accumulation in the bladder becomes greater the external sphincter is brought into action." —*American Text-Book of Physiology*, 1896. This we have been unable to observe, as the extensive operation interferes with this sphincter. If the desire to urinate is strong, the external sphincter is undoubtedly controlled by voluntary effort, but whether or not in mature filling of the bladder it is brought into play by involuntary reflex is not definitely determined. Emptying the bladder may be prevented, if desirable, when it is filled by voluntary contraction of the sphincter urethræ. According to Goltz, the voluntary control of the process of micturition is limited to the action of the external sphincter and the abdominal muscles. The contraction of the bladder is purely an unconscious reflex, taking place through a lumbar centre.

"Careful dissection[1] fails to show any thickening of muscle around the commencement of the urethra sufficient to constitute a sphincter; the absence of such a sphincter has been especially emphasized by Griffiths, and can be easily verified by dissection. There are, however, around the urethra collections of striated and unstriated muscle, which by their contraction close this canal and check the urinary flow. Thus, the first part of the urethra is surrounded by a muscular coat, consisting of inner longitudinal fibres and an outer, thicker, circular layer continuous with the inner and middle layer of the bladder. There is also a sheet of striped muscle which surrounds the greater part of the urethra, and extends from the level of the entrance of the vasa deferentia into the urethra to within a couple of inches of the urinary meatus. In man, the first part of this muscle is represented by a few transverse fibres on the ventral surface of the lower half of the prostate gland, and is known here as the external sphincter of Henle. Around the membranous portion of the urethra the sheet is termed the constrictor urethræ, and around the penile portion, the accelerator urinæ."

"The mechanism of closure of the bladder has been the subject of much discussion. Retention of urine has been variously ascribed to the elastic resistance of the tissues at the

neck of the bladder, or to the contraction of the internal sphincter, or to the external sphincter of Henle. Heidenhain and Colberg proved that the elasticity at the neck is not the only factor in closing the vesico-urethral orifice, as the bladder of the dead subject will not stand the same pressure as the living without leakage through the vesico-urethral orifice. If the lumbar spinal cord is disturbed the condition in favor of the living animal is abolished, showing that it depends on the existence of a tonic contraction under the influence of this part of the cord. There is no doubt that the greater part of the resistance offered to the outflow of urine is occasioned at the vesico-urethral orifice, only a small part being offered by the urethra itself. Thus, in surgical operations, the urethra may be incised up to the neck of the bladder without the escape of urine; and in the cat the urethra between the neck of the bladder and the prostate gland may be divided completely without any of the urine escaping. Reyfisch has excised the prostate in dogs without producing incontinence. Experiments show that resistance to the outflow of urine is situated at the neck of the bladder, and must be due either to the tonic contraction of the circular fibres at that point or to the elastic retraction of this orifice, aided perhaps by the position of the mucous membrane along the whole length of the urethra." Great care must, therefore, be exercised in any operation on the neck of the bladder not to interfere with the zone of control in the act of micturition.

Not only is the sexual function diminished or lost by the removal of the prostate, but it is materially interfered with by prostatotomy, as in the Bottini operation. Guitéras[2] says: "The patients are not *always* incapacitated for sexual life by the Bottini operation. From our observation it would appear that the prostate gland is placed over the neck of the bladder as a secondary muscular development. Its greatest bulk is made up of muscular tissue. It has situated within it a small glandular structure; the urinary control is entirely independent of the prostate, as was shown in my cases; for, if the prostate was removed the urine did not escape, except in cases where the bladder wall had been torn in liberating or detach-

ing the enlarged prostatic lobe. It is rather an accessory to the sexual function than to the urinary apparatus." G. Buckston Browne[3] believes that the prostate has no especial urinary function whatever. W. H. Howell[4] says: "By careful experiments upon white rats Steinach has shown that the removal of the seminal vesicles and prostate gland, while not diminishing the sexual passion and the ability to perform the sexual act, including the actual discharge of the spermatozoa, prevents entirely the fertilization of the ova. Removal of the seminal vesicles alone remarkably weakens the fertilizing power of the semen. The secretions of these accessory glands are essential to the mobility of the spermatozoa, and they may have other important functions." The function of the prostate is to contribute the prostatic fluid to the semen; the specific use of this fluid is not known.

Etiology. Browne believes that we have no reliable data on which to base a theory of the prostatic enlargement. However, he says, when asked how to avoid the malady: "I would suggest plain living, exercise on foot, very moderate worship at the shrine of Venus after fifty years of age."

The age at which prostatic enlargement begins is variously estimated. L. Bolton Bangs[5] believes that it begins a considerable time before the fiftieth year, and that the earliest manifestations of prostatic hypertrophy are not generally recognized. Prostatic hypertrophy is extremely rare in Japan, India, and China,[6] while in Turkey it is of comparatively frequent occurrence.

Schultze[7] states that enlargement of the prostate is rarely found in the negro, although he describes one in which the middle lobe, obtained by autopsy, measured 5 by 7 centimetres, and microscopical examination showed a marked hyperplasia.

We do not believe that excessive sexual indulgence plays any more part in the enlargement of the prostate than in the production of fibroma of the uterus; and it is well known that proportionately fibromata of the uterus are more common in the unmarried than in married women. Then, again, it is markedly absent in such races and nationalities as the Japanese, Chinese, negro, and Indian.

Our next knowledge of the etiology of the enlargement of the prostate may be summed up by saying that we know nothing definite about it.

Pathology. The benign neoplasms and enlargements of the prostate resemble very closely in their histology, in their mode of development, and their relations to the organ itself, the non-malignant neoplasms of the uterus. First, they are myomata, fibromata, and combinations of these two, principally the combinations, and not infrequently there is a general hypertrophy of the entire gland without any distinct tumor formation, resembling closely the soft, flabby, subinvoluted uterus. (See Fig. 12, Case III.) The enlargements are many times completely encapsulated, as shown in Figs. 18 and 19, Case VII. In a great majority, however, they are closely connected with the prostatic tissue itself (see Fig. 18, Case VII.), just the same as in the intramural fibroid there is always an enlargement and hypertrophy of the uterine tissue associated with the myoma (see right lobe, Fig. 18, Case VII.). In the lateral lobes the tumors are most frequently intramural, as seen in Fig. 19, Case VII., next submucous. In the middle lobe they are often pedunculated, rarely intramural, and practically never subcapsular.

Wishard[6] draws particular attention to the mechanical character of the obstruction in hypertrophy of the prostate and to the direction which the enlarged body takes—*i. e.*, toward the bladder in the direction of the urethra or in the direction of the rectum, as the case may be; the size in one direction bears no particular relation to its size in the opposite direction. It interferes more or less with the urinary function, depending upon the direction of the pressure, whether it be upon the urethra, bladder, or rectum.

Medical Treatment. James R. Hayden[8] strongly favors a conservative palliative treatment, and claims that while it does not cure, it at least prepares the patient better for the operation. His treatment consists of strict dieting, assisted by urotropin in full doses, to render the urine alkaline (sodium phosphate would accomplish this much better), and the administration of hyoscyamus, kava kava, triticum repens, and uva

ursi, associated with daily rectal injections of hot saline solutions and sitz baths. However, when operation is resorted to he favors prostatectomy, either by the suprapubic or peritoneal route.

The development of forceful and scientific procedures in the treatment of prostatic lesions has scarcely kept pace with the development of operative procedures in other fields of surgery. It has, however, though tardily, developed in the same lines with its analogous organ in the female, the uterus. Surgery of the prostate gland is now rapidly taking definite form on rational mechanical, anatomical, and histological bases.

During the last quarter of the century the sufferer presented a lamentable picture. Usually a man of great energy, strong mentality, physically robust, indefatigable in his labors, and by these had gained a competence whereby he could spend his declining years in comfort and the pursuit of pleasure, were it not for his prostate. By this he is deprived of his sleep, suffers intensely from pain, and sees no ray of hope for relief from his prostatic enlargement or its unpleasant sequences except in the grave. This picture may not fit the few, but it does fit the many, who suffer to a pathological degree from prostatic enlargement.

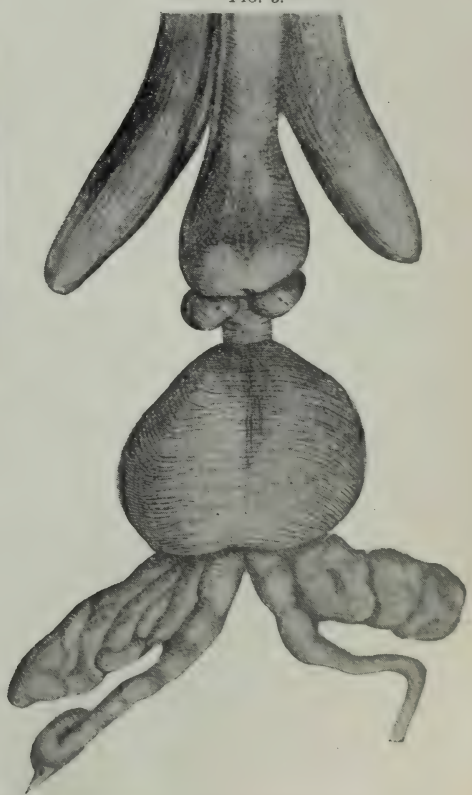
Temporary catheterization is resorted to for the relief of urinary retention, which comes on after some undue exposure, acute illness, traumatism, or what not, producing a temporary retention. This should be accomplished with all aseptic precautions, with the greatest gentleness in mechanical manipulation; it can always be accomplished where there is an absence of stricture of the urethra anterior to the prostate. There is no such condition as prostatic stricture. The urethra is always patent in its prostatic portion, and the obstruction offered to the passage of the catheter is the obstruction due to deformity, pockets, prostatic sinuses, and compression of the urethra by encroachments on its lumen from various directions by the enlargements or neoplasms in the prostate itself, as shown in schematic drawing, Fig. 9. All of these occur on the posterior and lateral portions of the urethra; the anterior portion offers no obstruction. The ideal course of the catheter,

FIG. 1.

Relation of the prostate to the deep perineal fascia, the rectum, the bladder, the seminal vesicles and ureters.

FIG. 2.

FIG. 3.



Relation of the prostate to the prostatic and membranous urethra, as well as the relations to the bladder wall and the seminal vesicles.

FIG. 4.

Relation of the urethral mucosa to the ejaculatory duct and prostatic sinuses, and the relation of the prostatic substance to the prostatic urethra.

FIG. 5.

Horseshoe shape of the prostatic urethra. Also the elevation of the floor of the urethra into the crescentic anterior wall which covers four-fifths of the entire circumference of the urethra. The fibres of the prostate extend into the verum montanum.

FIG. 6.

Tit-like projection of the middle lobe into the floor of the urethra.

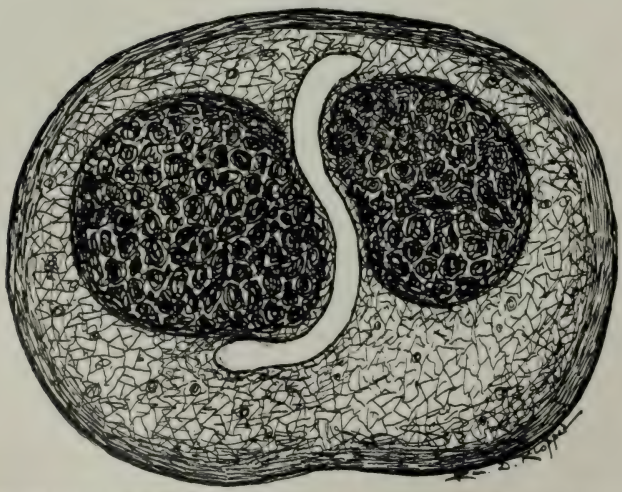
FIG. 7.

Muscle fibres of the bladder and the sphincter vesicæ internus, (*a*) with the prostate removed

FIG. 8.

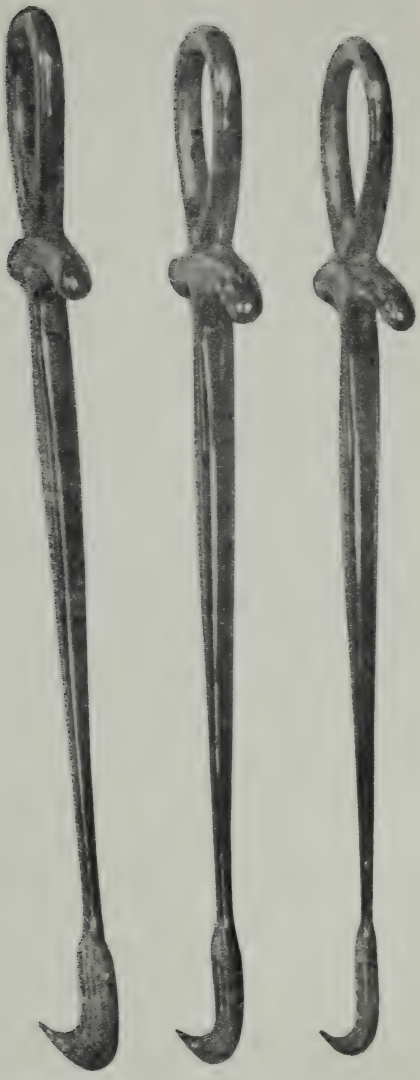
Hook retractors as applied to the prostate.

FIG. 9.



Changes in the shape of urethra produced by the myomata. Transverse section.

FIG. 10.



Traction hooks used for drawing down the prostate.

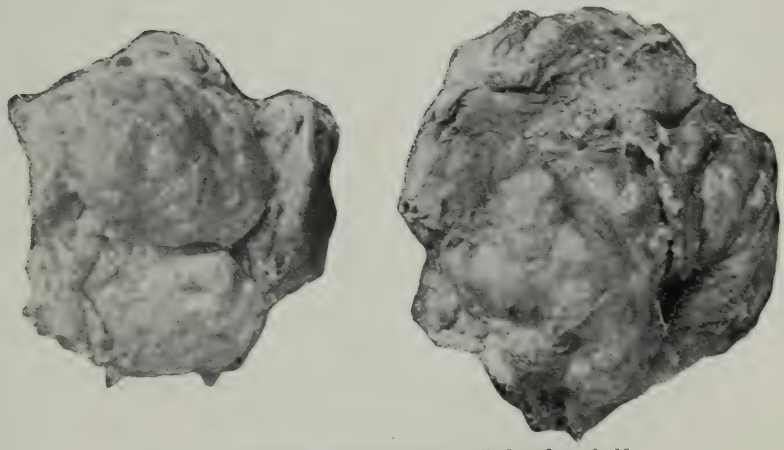
Fig. 11.

Traction hooks used for drawing down the prostate.

FIG. 12.

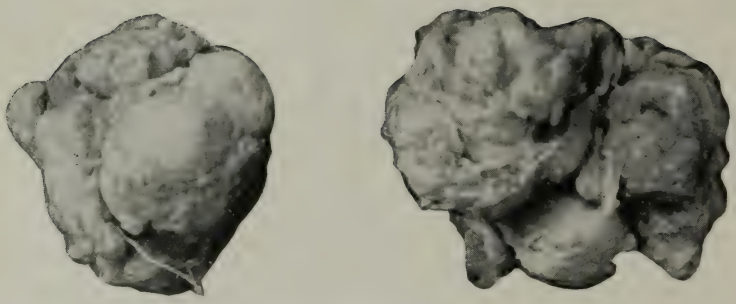
Gland removed from Case III. Natural size.

FIG. 13.



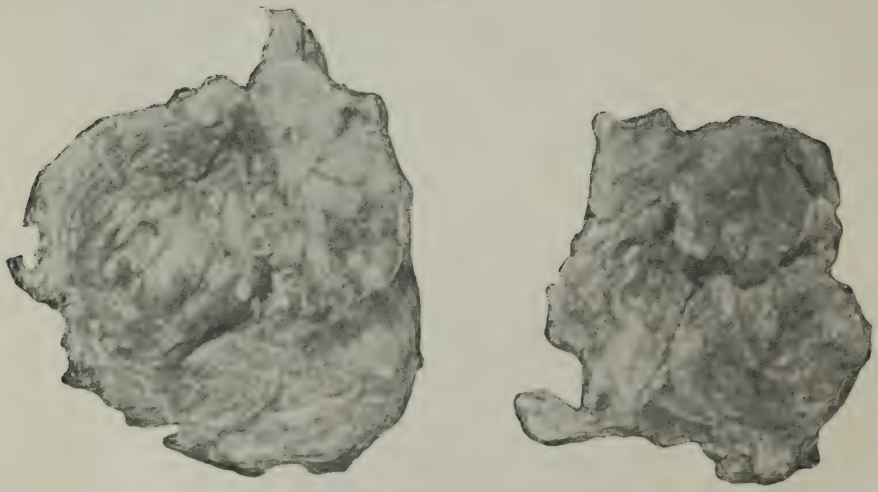
Photograph of prostate from Case II. Reduced one-half.

FIG. 14.



Photograph of prostate from Case IV. Reduced one-half.

FIG. 15.



Prostate from Case V. Natural size.

therefore, is along the anterior wall of the urethra. It is only a question of proper manipulation and an estimation of the directions of the canal for the successful accomplishment of temporary catheterization. In this force must play no part. It should and can always be accomplished by those of skill and experience in primary urinary retention, and the patient is, therefore, never forced to an immediate operation on his prostate under these circumstances, because he is then often in an unfavorable condition for operative procedure. The soft rubber, with or without the lead stylet, and coudee catheter, preferably of large size, are the best instruments to use. In these primary retentions the bladder may be completely emptied.

Continued or chronic retention presents to the surgeon many different as well as dangerous phases. Under these circumstances the bladder is often enormously enlarged; its veins are compressed, its walls anæmic from pressure, its arteries are frequently dilated, and advanced pelvic or peripheral renal changes may have taken place. Because of this protracted compression of the combined urinary surfaces, care must be exercised that this pressure is not too suddenly relieved—*i. e.*, that the bladder is not completely emptied; otherwise we have found by experience that there is an immediate congestion of the urinary surfaces, often followed by hemorrhage, frequently by shock, chills, fever, and death. A chronic sufferer from vesical distention should never have his bladder completely emptied in a primary catheterization.

Prostatotomy (Bottini). Dr. Ramon Guitéras[9] may be said at present to favor prostatectomy, but he admits that a large proportion of the cases are in such condition that no radical operation is justified; the Bottini operation in his hands has afforded this class of patients great relief. He has made a thorough investigation[10] of the Bottini method, and comes to the following conclusions: "It is difficult to conceive why an operation consisting simply in burning linear scars into the sides and floor of the prostate, and followed by the casting off of sloughs, should cause such a reduction of the urinary obstruction and such a contraction of the gland; clinical evidence, however, supports the truth of this statement."

Incontinence is rare after prostatotomy (Bottini). The cure of incontinence is not due to increased strength in the vesical sphincters, but to relief of the overdistended bladder, as the pre-operative incontinence in the sufferer is due to overdistention rather than lack of sphincteric tone.

There can be no doubt that there is an immediate relief of the urinary retention and its most distressing sequences by the Bottini operation in properly selected cases.

Dr. Hugh H. Young's experience with the Bottini operation covers 40 cases.[11] Six were lost sight of; 34 operations were performed on 31 patients, 3 patients having each 2 operations. The ages of these patients averaged very high, 18 being over sixty-seven years; of 15, over seventy years of age; all are alive and well. Three of the 31 died; 2 of these four and five weeks after the operation from uræmia; 1 from sepsis from a periprostatic abscess due to a 4.5 centimetre incision puncturing the capsule. In all there was an immediate relief of the urinary retention. Of 20 cases which were operated on a sufficient length of time to admit of deductions as to the result, 17 were cured, 2 improved, and 1 unimproved. Of the 8 others, the conditions were good up to the present time. All dispensed with the use of the catheter.

Dr. Bangs,[12] in commenting on his results with the Bottini operation, says that 60 per cent. of the subjects threw away the catheter; about 20 per cent. have an increased amount of spontaneous urination, and 20 per cent. received little or no benefit. He secures special advantages by the use of his solid-tip metal catheter after the Bottini operation. In the 40 cases he reports there were 3 deaths directly attributable to the operation. Two of these were from sepsis and 1 from shock. Notwithstanding these apparently favorable results,[13] he pronounces the operation a serious one and not to be lightly undertaken; that the danger is in proportion to the severity and extent of the operative procedure; that the symptoms immediately following the Bottini operation are frequent urination, with considerable pain; hemorrhage, either primary or secondary, in about one-third of the cases; fever in 30 per cent. and chills in 20 per cent., and that the post-operative

period, in which these symptoms are present, continue for from two to three weeks. Incontinence, an annoying symptom, was present in 6 per cent.; 9 per cent. were operated on twice, and 2 per cent. of these were not benefited by the secondary operation; in 20 per cent. there was no benefit. Guitéras[14] collected 753 prostatotomies; 622 were cured (82.5 per cent.), 44 died (5.8 per cent.), 87 were failures (11.5 per cent.). Dr. J. W. S. Gouley[5] concludes that the Bottini operation has no advantage over the Mercier operation, which he introduced in this country in 1878, and has performed fifteen times. He believes that the operation of prostatectomy is the one indicated where the prostate is enlarged, whether soft or hard. Dr. S. Alexander[5] considers that the technique of the prostatectomy bearing his name is a most dangerous and difficult one, and he is disposed to discuss its failures rather than its successes. He considers the Bottini operation favorable in selected cases, and wishes to impress upon its adherents that the obstruction in prostatic enlargement is not intravesical, and, therefore, could not be observed with the cystoscope or searcher. Willy Meyer[5] believes that the width as well as the depth of the incision in the Bottini operation is important. He uses a permanent Mercier catheter after the operation and keeps the urine loaded with antiseptics. He considers that prostatectomy is the more surgical procedure, and that the after-treatment is much less difficult and arduous than after the Bottini operation. He also considers the soft prostate difficult to cure by prostatectomy.

The destruction was accomplished by me a few times at the Alexian Brothers' Hospital by means of thermocautery through the suprapubic route, with a vaginal rubber speculum inserted into the bladder, but the average results were such as not to encourage me in continuing the work, and I have abandoned it for perineal prostatectomy.

PROSTATECTOMY. It is very gratifying to note the advances that have been made by the medical profession in the operative treatment of prostatic enlargement in very recent times. Even so modern a man as Sir Henry Thompson said that he did not believe it was possible to operate on a case of enlarged prostate

and have a result that would permit him to discontinue his catheter and still be able to empty his bladder and retain his urine; now we know that these results are of daily occurrence.

The indications for prostatectomy are: 1, prostatic enlargement to a pathological degree; *i. e.*, sufficient to prevent urination or cause large residual retention; 2, painful and frequent urination; 3, cure for catheter life; 4, cure for secondary cystitis; 5, for the relief of pressure on the rectum; 6, it should be the operation of election where the patient is in condition to withstand the operative procedure and the local and general conditions are favorable. The operation should not be considered nor used as a last resort. Local or spinal anæsthesia should be preferred in selected cases.

Suprapubic Prostatectomy. Dr. William T. Belfield, of Chicago, deserves the honor of being the first to follow a deliberate plan for the removal of the middle lobe through a suprapubic incision. This was not an accident, as suggested by Mr. G. Buckstone Browne, but was a deliberately planned and executed operation, as was well known to many of the Chicago profession at that time; the honor is incontrovertibly his; while Dittle's operation was not deliberately planned and executed, but was done in an emergency. Mr. A. F. McGill laid down more definite indications and lines of procedure three years after Belfield's original work, although we believe it can be said that McGill had no knowledge of the Chicago surgeon's technique at the time he performed his first operation

The suprapubic route was the one I uniformly followed in my ten years' service at the Alexian Brothers' Hospital. Either enucleation or cauterization was accomplished through a suprapubic opening by the aid of curved scissors, Kocher's dissector, volsella forceps, and the index finger. The middle lobe was readily and easily enucleated, but the enucleation of the lateral lobes through the suprapubic route was always a difficult, bloody, dark, and unsatisfactory procedure, though many times very gratifying in its relief to the patient. In this technique there is practically no danger of opening the peritoneum, as the base of the prostate is situated fully half

the length of the bladder below the most dependent portion of the vesicorectal folds, and is very movable at that point. There is danger, however, of lacerating the rectum.

Dr. Charles H. Mayo favors the suprapubic enucleation of very large middle and lateral lobes, and believes that the technique is more simple and the results more favorable by this procedure, using suprapubic or suprapubic and perineal drainage, according to individual indications.

Proust[15] describes an elaborate technique for a subtotal prostatectomy with subsequent suture of the pedicles. The vasa differentia and the slit in the urethra are also sutured, while a catheter is left in place. The suturing of the vasa deferentia or seminal vesicles would seem to us a difficult task. Mr. P. F. Freyer,[16] commenting on injuries to the seminal vesicles, considers that it is a matter of little importance what becomes of the ducts, and pays no attention to them. In speaking of hemorrhage, he claims in suprapubic operations that when the gland is enucleated from the capsule there is little hemorrhage.

Dr. Ramon Guitéras[14] collected 153 prostatectomies by various methods. Of these 110 recovered, 72.3 per cent.; 25 died, 16.4 per cent.; 17 were failures, 11.2 per cent., and he concludes that the results in those that recover from prostatectomy are better and more permanent than those following prostatotomy. He believes, however, that great care and judgment must be used in the selection of cases, and submits the general rule that "the large glands are favorable for enucleation and the small ones are best treated by prostatotomy; and if the kidney be diseased, either medically or surgically, the Bottini should be resorted to."

Eugene Fuller[17] favors the suprapubic route for the large prostates, and believes that the operation of enucleation can be performed cleaner and safer in that way; but, where the bladder wall is hypertrophied, he considers it much easier and safer to use the perineal operation.

From the 15 cases of suprapubic prostatectomy reported by Dr. Hugh H. Young,[11] there were two deaths, neither of which, however can justly be attributed to the operation. The ultimate results from the suprapubic operation were favor-

able. In this number he classes 11 as "complete enucleation of the prostate." (I believe, however, he means enucleation of the lateral and posterior lobes, and not a complete prostatectomy.) Ten of the 15 were classed as cures, and two still suffer from cystitis.

Dr. Floyd W. McRae[11] strongly favors the suprapubic operation, and reports three successful cases. He considers there are special advantages in his ingenious "parachute" drainage method. One of his operations was on a case previously treated by the Bottini plan.

Mr. Harold L. Barnard[18] thinks that the success following enucleation of the prostate for adenomatous hypertrophy, which he considers the most suitable type, is not equalled by any other method of treatment, although he prefers the suprapubic method.

Dr. William N. Wishard[6] strongly favors the suprapubic Belfield-McGill operation as modified by Fuller and Alexander. He believes that it is the most direct means of attack, and gives the best results, as expressed in the following: "If the suprapubic operation has been thoroughly done, and the obstruction all removed, the patients afterward are assured of more perfect function than by any other method." He thus expresses himself concerning the perineal operation: "The operation may be regarded as limited to drainage operations and to small pedunculated growths and to the division of collar-shaped enlargements of small size."

Perineal Prostatectomy. Dr. Syms[19] prefers the perineal route, because it appears to him the most direct. He believes[20] that the median perineal incision should be made, and considers that he derived great advantage from his prostatic retractor in the 12 cases in which he used it. He favors the removal of the left lobe first, the middle lobe second, and the right lobe last, and the use of a steel sound every third day after the operation. He forcibly advocates the early operation. He operated on 9 cases; all recovered; in 8 there was complete restoration of function.

Dr. J. W. S. Gouley[20] favors the perineal route. The retractor of Gouley[21] appears to have many advantages,

although I have not used it, as the hooks are so much more readily applied.

Dr. John A. Wyeth[22] believes the perineal operation the one of choice. Dr. Alexander agrees in this view, but makes the suprapubic incision so that he may force the prostate into the perineum. This is not necessary where the hooks are used and the capsule and deep perineal fascia properly divided. Most of Dr. Alexander's patients were out of bed in five or six days. No aged patient after any operation should be allowed to lie flat on his back. He should be placed in a sitting position immediately, should occupy the recumbent position at night, and should be out of bed as early as the fourth or fifth day.

Dr. Alexander Hugh Ferguson[11] reported six cases at the Atlanta meeting, in which he removed the prostate by morcellement. He claims advantages for this method, and has a prostatic forceps so constructed as to "bite" out fragments of the prostate without danger of injury to the surrounding parts; he also has an intravesical depressor, which he believes adds much to the ease with which the operation is performed. His six patients made good recoveries. He also calls them complete prostatectomies, while I believe he means lateral and posterior prostatectomy, allowing the portion of the prostate known as the "isthmus" anterior to the urethra to remain.

Dr. James Bell[23] beautifully illustrates, with a case, a type of prostatic enlargement, in which the Bottini operation would have served no purpose and in which a prostatectomy produced an ideal result.

Dr. Charles Whallen[24] favors spinal anæsthesia for prostatectomy.

By the perineal operation the wall of the bladder should not be divided or torn, but the posterior wall of the prostatic urethra should be removed. The urethra should never be opened primarily, and the prostate should never be shelled away from the bladder from before backward, but always from behind forward, dividing the isthmus as the prostate rolls off from the bladder. To favor this I have used, with the ordinary deep lateral retractors and Sims' speculum as a posterior

retractor, the hooks shown in Figs. 10 and 11. The hooks are utilized: 1, to draw the prostate into the field and retain it there; 2, to evert the prostate while it is being detached from above downward from the bladder wall.

It is entirely unnecessary in the operation of prostatectomy to remove the whole anatomical structure, as is claimed by Freyer,[18] as the anterior portion of the prostate, or isthmus, never shows any material encroachment and never produces urinary obstruction. It can, however, be as easily removed, if the entire enucleation be desirable, by the perineal route as by the suprapubic if the hook retractors be used as in the drawing. The hemorrhage is very much less by the perineal than by the suprapubic route.

Case I.—Mr. E. W. W., aged fifty-five years; occupation, financier; was referred by Drs. Henry Hooper and Archibald McLaren. He was admitted to Mercy Hospital, May 16, 1901, and operated on May 18, 1901. He was discharged June 26, 1901.

Family history was negative.

Personal History. He has had a specific urethritis; stricture followed; cured.

Present Illness. Three years ago he began to suffer from increased nocturnal micturition not associated with pain. This continued, increasing in frequency, and rest at night was much disturbed; then the frequency of urination in the daytime markedly increased. Finally, about two years ago, the catheter was first resorted to, which was used only every second or third day in the beginning. The vesical irritation, however, became greater, and the quantity of pus in the urine increased until daily vesical lavage was resorted to by the attending physician, the catheter being used several times daily for the relief of urinary retention. A portion of the urine could be voided by strained efforts, leaving about three ounces of residual urine. These symptoms continued up to time patient was admitted to the hospital; he was entirely incapacitated for work.

Examination. Urine examined shows a trace of albumin, some blood, and a large amount of pus. Urea, 1.8 per cent.;

specific gravity, 1024. With difficulty a sound was introduced into the bladder. Prostate was very much enlarged; left lobe largest; median lobe pressed markedly backward. Patient is emaciated and very neurotic.

Operation. Usual preparations; saline cathartic and enema. 1. Lithotomy position. 2. Ferguson's prostate staff introduced into bladder. 3. Fuller's semilunar incision in perineum, through perineal tissues up to the membranous urethra, extending laterally to the rami, and from lower margin of scrotum in centre to level of the anus at the external ends. 4. With finger in rectum, tissues between urethra and rectum were incised sufficiently to bring the prostate well into view and free it entirely from rectum. 5. Prostate was pressed well downward and forward by means of staff in bladder. Capsule of right lobe was divided parallel to urethra and shelled off; right lobe grasped with volsella and carefully drawn down and dissected until the dissecting finger passed over the base, and then the prostate was liberated from the bladder, from base to apex of lobe, and amputated. 6. Left lobe was treated likewise; a small rent was made in the prostatic urethra during the dissection. 7. Two small median lobes were then shelled out. 8. Tube placed in bladder through perineal opening, and soft rubber catheter inserted through penis; cavity packed with gauze. 9. One side and apex of incision sutured with silkworm-gut. Hemorrhage was slight. 10. Dressings and bandage.

Patient returned from operating-room; pulse, 82; complained of some smarting pain; was placed in a semi-sitting position at angle of 40 degrees.

May 19. Pulse was 96; temperature, 99.6°. Patient rested fairly well during the night; no hemorrhage to speak of.

20*th.* Pulse, 90; temperature, 100°; rested fairly well; good drainage through both catheter and perineal tube.

28*th.* Pulse, 88; temperature, normal since May 20th. Urine passed through tube, 715 c.c.; alkaline; specific gravity, 1015; cloudy; few hyaline casts; round, oval, and spindle cells; numerous red blood-corpuscles; pus cells numerous; bacteria present.

29*th.* Pulse, 88; temperature, 98.2°. Tube became obstructed and catheter also; latter was removed.

June 1. Pulse, 98; temperature, 100°. Considerable pain in lumbar region. Tube removed and permanent catheter inserted. Patient has a mild pleuritic friction sound.

4*th.* Pulse, 86; temperature, 98.6°.

9*th.* First voluntary urination through urethra; the day following practically all the urine passed through this channel; full control and painless. Patient is doing well; sitting up.

17*th.* Pulse, 76; temperature, 98.6°. Patient is sitting up daily; 1320 c.c. urine voided in last twenty-four hours; perineal wound healed.

23*d.* Pulse, 78; temperature, 98.6°. Patient went for a drive; feeling well. Amount of urine collected in twenty-four hours, 1375 c.c.

26*th.* Pulse and temperature normal. Patient was discharged, feeling well; has good control over bladder; urinates every two to four hours in daytime, but is not disturbed at night; no residual urine. Urine: specific gravity, 1005; urea, 0.9 per cent.; no albumin; granular renal cells; few pus corpuscles. Not the slightest pain on urinating.

February 4, 1902. Patient has perfect urinary control; can sleep the entire night without urinating. He says his urinary apparatus feels like it did when he was a boy.

Case II.—Mr. J. S., married; aged fifty-four years; merchant; was sick seven years; diagnosis of prostatic hypertrophy. He was admitted to Mercy Hospital July 3, 1901, and operated on July 13th.

Family History. Father died of tumor in throat in 1861.

Personal History. Patient was born in Germany, but lived forty-four years in America. General health was always good; appetite good; bowels regular.

Past Illnesses. He had an infection in arm when sixteen years old, and has running sore at present as result of same; chronic dysentery in 1865.

Present Illness. For past seven years patient has been troubled with painful urination and inability to empty bladder. For past five years there were times when patient could urinate

quite freely, but cold or exposure would make it extremely difficult. Two years ago he began catheter life, continuing it for thirteen months. He then received some electric treatment and dispensed with the catheter, although urination was very difficult and painful. Early this spring the symptoms increased in severity. He resorted again to the catheter, passing considerable pure blood at times. Patient states that as far back as seventeen years his bladder has been weak, and he did not have proper power of expulsion; has suffered extremely in an effort to abandon the catheter, using it but once in three weeks. The prostate is very much enlarged and almost fills the pelvis.

July 12. Chemical examination reveals a trace of albumin. Microscopical examination shows pus in quantity. Residual urine, 3½ ounces.

13*th*. Operation after usual preparations. 1. Lithotomy position. 2. Ferguson's sound introduced into bladder and held in place throughout operation. 3. Y-shaped incision, as in Case I., through perineal structures until prostate was reached. 4. Posterior broad Sims and narrow lateral retractors inserted; wound held wide open. 5. Circular incision through capsule of right lobe, which was shelled out from above downward by blunt dissection with the finger, the isthmus divided with scissors, and removed *en masse*. Same procedure for left lobe. 6. Middle lobe removed with scissors; posterior portion of prostatic urethra removed with gland. The bladder retained the urine, and a large rubber tube was inserted into it through the perineum. Wound packed with gauze; tube secured to tissues with silkworm-gut; permanent catheter inserted into bladder through penis. There was considerable hemorrhage from the left side, which was controlled by a six-inch hæmostatic forceps, which remained for twenty-four hours.

Patient returned from the operating-room in good condition. Pulse, 104; temperature, 97.4°; strychnia sulph. and spts. ammon. aromat. were the only medication. (See Fig. 13, Case II.).

15*th*. Temperature, 100.8°; pulse 90 sixty hours after operation, then normal until July 26th. Occasionally an in-

fusion of triticum with cathartics sufficient to keep the bowels open, and general diet.

23*d*. Perineal drain removed.

25*th*. Catheter removed.

August 1. Temperature, 102°; pulse, 120. Patient in great pain, caused by a mild epididymitis.

3*d*. Temperature dropped to 99.3°; pulse to 100. Patient passed some urine through urethra.

9*th*. Passing all urine through urethra and can hold it as long as two hours. Perineal wound closed.

12*th*. Temperature, 99°; pulse, 100; night-sweats. Amount of urine, 700 c.c.; specific gravity, 1017; urea, 2 per cent.; trace albumin. Some squamous epithelium; some pus cells. Testicle still painful and somewhat swollen.

18*th*. Temperature, normal; pulse, 80.

22*d*. Patient is discharged, with full control of urine and practically no pain on urination.

Dr. R. H. Foster, of Le Mars, Iowa, reports as follows, January 30, 1902: "The muscular fibres of the bladder have completely regained their lost tone, and he can propel the stream to a normal distance. The frequency of micturition, especially at night, has disappeared to such an extent that during the past three months he has not had any call to get up at night except while suffering from the orchitic attack, which I mentioned to you in my former letter. The power of retention has returned to a normal condition; also the lumen of the stream, which is remarkably full in volume, and is neither flattened, forked, nor twisted."

Case III.—Mr. A. J., aged sixty-seven years, merchant; was sick two years. He was admitted to Mercy Hospital August 24, 1901, with diagnosis of prostatic hypertrophy and cystic calculi.

Family history is negative.

Personal History. Suffered severely from constipation.

Past Illnesses. He had malaria in 1860 and sciatica at intervals for the past ten years.

Present Illness. Began two years ago with frequent desire to urinate and vesical tenesmus; burning in perineum, hypo-

gastrium, and glans penis, which was relieved on urinating. Patient has been compelled to use catheter at intervals for past nine months. Three months ago a few drops of blood appeared at the end of urination. In the past few weeks patient has suffered severely from vesical spasm, which was not relieved by emptying the bladder. The prostate is very much enlarged. Stone detected.

August 24. Reaction of urine acid; specific gravity, 1013; small amount of albumin; urea, 1.4 per cent. Microscopic: Epithelium, a few squamous cells; many red blood cells; pus in quantity. Residual urine, 10 drachms.

25*th*. Operation, following usual preparations. 1. Lithotomy position. 2. Ordinary steel sound introduced into bladder and kept there. 3. Incision as in previous cases. 4. Prostate exposed and rectum entirely freed. Right lobe of prostate brought into view; capsule incised parallel with urethra and right lobe enucleated, drawn down with volsella forceps and removed. Left lobe, with portion of urethra, then removed. Middle lobe was easily enucleated. 5. Forceps introduced into bladder and stone removed without difficulty. 6. Rubber catheter introduced through urethra into bladder and secured. Large rubber tube introduced into bladder through perineum, and perineal wound packed with subiodide bismuth gauze to suppress the oozing. 7. Deep sutures of catgut to bring the structures into apposition. 8. Interrupted silkworm-gut sutures for partial closure of incision. 9. Dressings. (See Fig. 12.) Patient returned from operating-room in good condition. After nausea had ceased he was put on urotropin, 7 grains, t. i. d.; liquid diet.

27*th*. Patient rested well; pulse, 102; temperature, 101°. Wound dressed; some oozing; bladder irrigated with solution of boric acid.

28*th*. Pulse, 80; temperature, 100°. Patient had some pain; wound dressed. Urine in bottle, 720 c.c. Considerable urine lost in dressings.

29*th*. Drainage free; patient easy; 900 c.c. in urine.

30*th*. Pulse, 88; temperature, 98.8°. Urine, 1000 c.c., through tube.

31*st*. Pulse, 88; temperature, 99°. Patient delirious short time. Amount of urine, 2000 c.c.; reaction, acid; specific gravity, 1015; turbid; urea, 2.4 per cent.; albumin in quantity. Small squamous epithelial cells; few red blood-corpuscles; considerable pus; bacteria present.

September 1. Pulse, 84; temperature, 98.8°. Patient rational; suffering pain and stinging sensation.

4*th*. Wound looks healthy. Pulse, 80; temperature, 99.6°.

10*th*. Pulse, 78; temperature, 98°. Perineal sutures removed.

12*th*. Pulse, 70; temperature, 100°. Perineal wound closing rapidly and looks healthy.

14*th*. Patient had chill. Pulse, 88; temperature, 102°. Siphon attached to catheter.

15*th*. Pulse, 80; temperature, 98.8°. Right testicle swollen, tender, and painful; left epididymis indurated, which accounts for chill yesterday. Applications of ice. Scrotum suspended.

16*th*. Pulse, 78; temperature, 99°. Urotropin, grains 5, t. i. d. Swelling in testicle reduced. Urine examination: Specific gravity, 1015; clear; urea, 2.2 per cent.; numerous pus cells; otherwise normal.

22*d*. Pulse, 78; temperature, 100°. Patient rested well. Urine ceased to pass through perineal wound; allowed up daily.

November 7. Pulse, 72; temperature, 99°. Some pain, but has control of urine. An abscess formed in perineum which required drainage.

Case IV.—Mr. W. S. M., aged fifty-eight years, married, farmer; was sick eight years. He was admitted to Mercy Hospital November 4, 1901.

Family History. Father died of rheumatism and heart complications at the age of forty-nine years. Mother died of Bright's disease at the age of sixty-eight. One sister died of throat and lung trouble, probably tubercular.

Personal History. Always moderate user of whiskey; beer always seemed to aggravate present trouble. About nine years ago began to get up to urinate at night, but for last three or four years has been getting up three or four times; would

pass small amount of urine each time. During first few years of trouble urine showed heavy brick-red deposit on standing, but of late years has been clearer, with some offensive odor.

Past Sicknesses. Has had a right side inguinal hernia since twenty-one years of age; has had hemorrhoids for many years, but they have been worse since present trouble began, due to constant straining on urination.

Present Illness. Patient was thrown from a horse and fell astride a ridge of dirt in the road eight years ago. There was considerable tenderness in the perineal region after this injury. Skin was not broken, but parts were bruised. He was put to bed; had chills and fever for next twenty-four hours. He only remained in bed for a day or so, and passed his urine at the time with effort. There was no blood in urine or in stools. Since that time he has been troubled almost constantly with bladder trouble. There has been vesical tenesmus when on his feet; if in bed he can hold urine longer. Patient can start the flow of urine without much pain, but at the end of the act there is a dull burning and a dribbling for some time. When trying to hold the urine for any length of time there is a sudden loss of half an ounce or so before he can control it. For a long time the patient has had a cutting pain in end of penis when through urinating. The straining at the end of urination brings down a small tumor mass in the rectum not unlike a hemorrhoid. All of the above symptoms have been getting worse for the past four or five months. He was catheterized but once, and that last summer by a home physician, to see if there was retention of urine. He has never had any chills or fever since injury eight years ago. Patient has never been confined to bed, but has never been able to work, for as soon as he walks or rides he has the desire to urinate, with the pain following. State of nutrition good; appetite good; bowels constipated.

Examination. Prostate enlarged to second degree; stone detected behind prostate.

On November 6th the patient was prepared for operation in the usual manner. A sound revealed size of stone in the bladder; the prostate was very much enlarged. Technique same as in previous cases, except the staff was dispensed with

after the capsule was exposed and the prostate drawn forward with the hooks shown in Fig. 8. The hooks were found of great assistance, as they permitted an easy separation of the base of the prostate from the bladder and rendered the staff needless. The stone was extracted after the removal of middle lobe. (See Fig. 14.)

November 6. Nothing to record but an intermittent pulse, which quickly responded to strychnine. The highest temperature and pulse rate were 101.4° and 104°, respectively.

7*th*. Patient rested well; complained of some pain in bladder. Average temperature and pulse same as previous day.

10*th*. Patient resting well. Temperature, 99.6°; pulse, 89; urine, 600 c.c. through tube.

11*th*. Temperature, 98.8; pulse, 93; wound dressed with dry dressing; saline cathartics; urine, 690 c.c.

12*th*. Temperature, 100.8°; pulse, 99. Patient resting well. Packing removed; no pus; catheter irrigation; all drainage found free; scrotum somewhat œdematous; left testicle enlarged and tender; right slightly enlarged.

13*th*. Temperature, 101.5°; pulse, 97; bladder irrigated; perineal drain removed.

14*th*. Temperature, 99°; pulse, 82. Drainage free; urine, 900 c.c.

15*th*. Temperature, 98.6°; pulse, 83; resting; urine, 100 c.c. through catheter.

16*th*. Temperature, 98.9°; pulse, 81; patient perfectly easy; urine, 2160 c.c.

17*th*. Temperature, 99°; pulse, 76; resting; catheter removed.

20*th*. All urine passed through urethra; perineal wound practically closed.

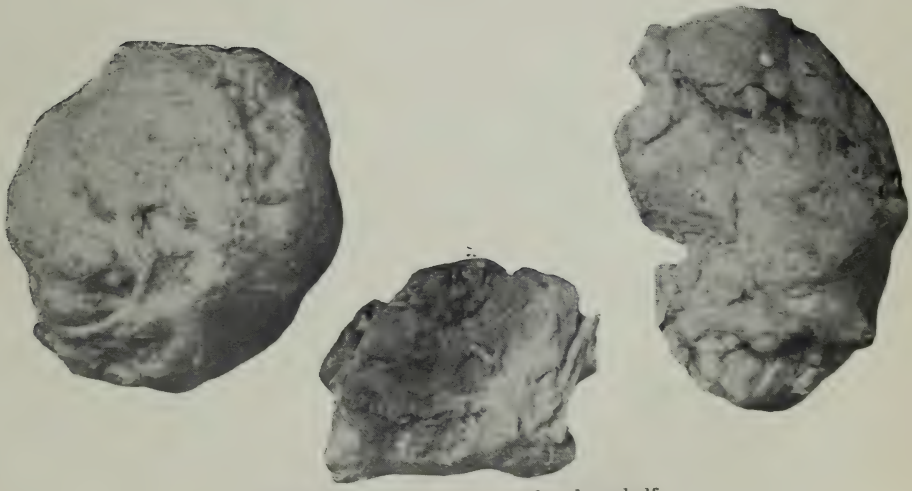
December 4. No vesical pain. He can hold urine four to six hours, and does not have to get up at night. Microscope reveals small number of pus corpuscles in urine.

Case V.—Mr. P. T., aged sixty-two years, retired farmer, was sick four years, and admitted to Mercy Hospital December 2, 1901.

FIG. 16.

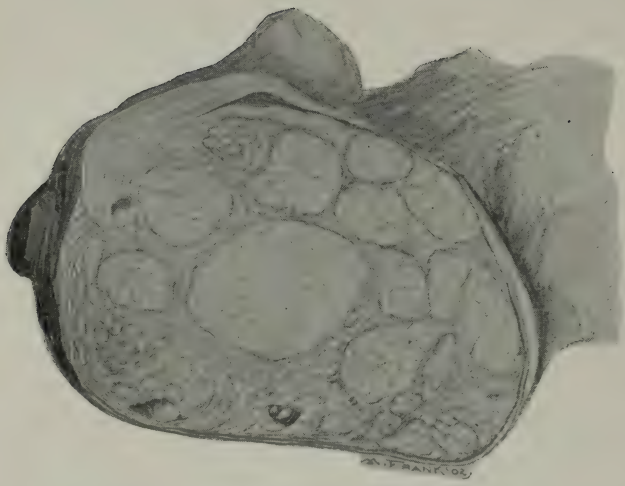
Lobes attached to each other. Case VII. Reduced one-half.

FIG. 17.



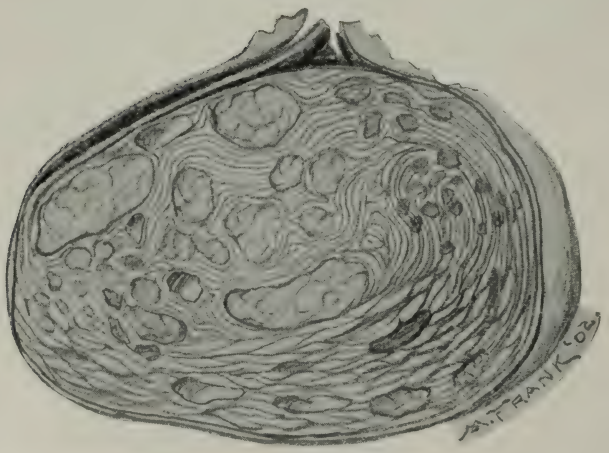
Lobes separated. Case VII. Reduced one-half.

FIG. 18.



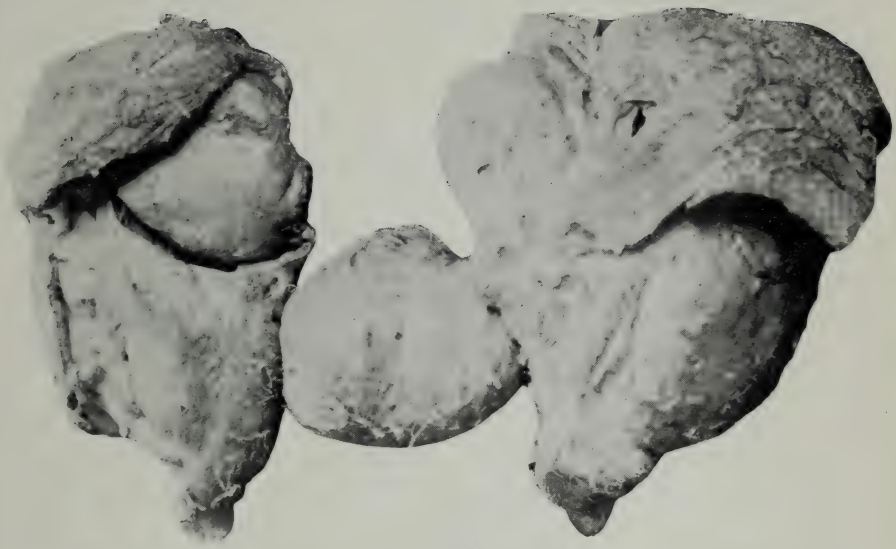
Transverse section of right lobe from Case VII., illustrating the numerous small myomata in the upper portion and the hyperplasia in the lower.

FIG. 19.

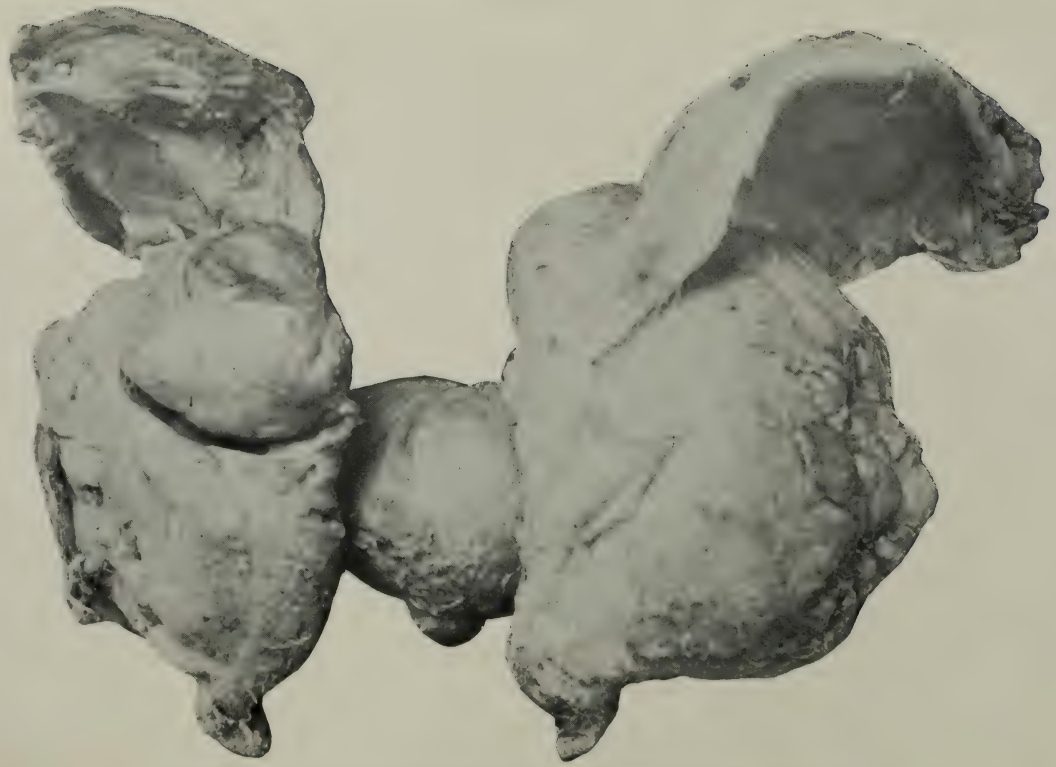


Drawing from cut surface of middle lobe of prostate from Case VII., showing about the same histological structure as the lateral lobe with distinct loosely attached capsule.

Case VII. *a*.



Right lobe shows hypertrophied prostatic tissue firmly attached to the myoma, also the feeble attachment of the middle to the lateral lobe.



Left lobe, shows enormous hypertrophy of prostatic tissue around a small myoma.

Personal History and Previous Illnesses. Usual diseases of childhood. Malaria many years ago. La grippe seven years ago, since which general health has not been as good as before, though fair. Appetite is good; bowels somewhat constipated for past four years; no bladder or kidney symptoms previous to present trouble. Venereal history is negative.

Present Trouble. About four years ago began to have frequent urination, four times nightly, latterly eight or ten times; small amount of urine passed each time; total amount of urine passed was probably normal. Was treated by irrigation of bladder and local applications of electricity. Took diuretic tablets. About three years ago was unable to urinate and had catheter passed, but has not needed catheterization since then until ten weeks ago, when he catheterized himself, and has done so several times since that time. For past ten weeks he has irrigated his own bladder, daily or oftener, with boric acid in boiled water. About eight weeks ago he caught cold and had two quite severe chills, followed by temperature of 103° to 104°, lasting a day or two, and was confined to bed a week or more. Two days ago patient had slight chill and temperature of 100°. Patient complains of no severe pain, but has had some discomfort about perineum, and pain running into penis, aggravated by walking, standing, and sitting. He has less discomfort when he drinks much water; has burning pain on urination, especially when passing small amounts of concentrated urine; has noticed brick-dust sediment in urine at intervals; has not noticed pus.

December 3. Pulse, 84; temperature, 98.8°; 250 c.c. urine during night. Bladder irrigated with 1 per cent. sulpho-carbolate sodium in 1 to 4000 solution of formalin. Urinalysis: Specific gravity, 1016; urine, turbid; urea, 2.4 per cent.; phosphates increased; indican present; no casts or albumin; many pus cells.

10*th*. Bladder has been irrigated daily since admitted. Tonics and diuretics administered, also urotropin. The prostate extends backward, pressing the rectum, and the lobes seem to fill the pelvis to the rami on either side. A stone was detected.

11*th*. *Operation*.—1. Ether anæsthesia; lithotomy position. 2. Inverted Y-incision in perineum from posterior fold of scrotum to the rami on a level with the anus. 3. With finger in rectum the perineum was divided on either side of the corpus cavernosum until the prostate was reached, and then the central septum was divided. Beak lateral retractors and Sims' posterior retractors were used to expose the field of operation. 4. Capsule of gland incised parallel with urethra and separated from gland by blunt dissection with finger and Kocher dissector. 5. Right lobe is grasped with small hook retractor and drawn down and out, and then grasped with second hook retractor and rolled forward and separated from the bladder down to the isthmus, where it was divided; left lobe treated in like manner. Middle lobe removed with small portion of posterior prostatic urethra. Anterior isthmus not disturbed. The stone was then removed with a lithotomy forceps. 6. Rubber drainage-tube passed into bladder through perineal opening; this was surrounded with bismuth subiodide gauze as a packing. 7. Wound closed except on left side with silkworm-gut; left side left open for passage of tube and gauze. 8. Dressings and bandages. Patient returned from operating-room and was placed on back-rest at an angle of thirty degrees. Pulse was 78, low tension; temperature, 97.4°. He rested quietly and comfortably. Siphon and bottle were attached to drainage-tube in perineum. (See Fig. 15, Case V.).

13*th*. Pulse, 88; temperature, 99°. Patient is drowsy and comfortable.

14*th*. Pulse, 82; temperature, 99.2.° Quite comfortable; free drainage.

15*th*. Pulse, 84; temperature, 98.4°. Patient quite comfortable. Dressings changed three times; some of the packing removed. He voided 1530 c.c. urine through tube, and slept well.

16*th*. Pulse, 88; temperature, 98.8° He voided 900 c.c. urine through tube; slept ten hours; feels quite comfortable.

17*th*. Pulse, 88; temperature, 99°; 1200 c.c. urine through tube; slept ten hours.

19*th*. Pulse, 80; temperature, 99°; 1500 c.c. urine through tube. Perineal tube and packing removed; slept ten hours.

22*d.* Pulse and temperature were normal since 19th. Catheter passed through penis. Passed small portion of urine through urethra. Wound in excellent condition.

January 1. Catheter with stylet passed. He passes urine by both perineum and urethra.

5*th.* Wound is healing rapidly. No urine passes through perineum. He is up and walking around room. Patient feels quite well; has control of urine.

18*th.* All urine passes per urethram; full control. Patient is discharged, feeling quite well; can sleep all night without urinating. Urine, acid; specific gravity, 1014; trace of albumin; some pus corpuscles.

CASE VI.—Mr. L. D. R., aged seventy years, widower. Father died at eighty-eight years of strangulated hernia. Mother died at sixty-six years of age of cancer. Two brothers died of prostatic disease, with complications, aged seventy-seven and eighty-two years. One brother died of pneumonia at seventy-seven years. Four brothers living and in good health, aged sixty, sixty-four, seventy-three, and seventy-seven years. Three sisters died of "female diseases," aged fifty, fifty-two, and fifty-three years. He has three sisters living and in good health, aged sixty, sixty-eight, and seventy-five years. He came under observation of Dr. F. A. Turner, Sandwich, Ill., September, 1901, with symptoms of prostatic inflammation, which continued for several days until there was a free discharge of pus from rectum, when the symptoms subsided. He did not see him again until November 11, 1901, when present attack began with severe pains in the prostate and a constant desire to pass water, being able to void but small quantities of turbid urine, which contained considerable pus. On November 14th complete retention came on, and, notwithstanding that a large amount of pus was discharged from rectum on night of 14th, the retention continued complete until the 22d, the date of operation. He was catheterized every three or four hours. Amount of residual urine not obtained.

Operation was made December 20th. Technique was same as in previous operations. Abscess was found in left lobe.

Both lateral lobes were very much enlarged. Lateral and middle lobes were removed.

Post-operative History (kindly furnished me by Dr. Turner). During first six days after operation pulse varied between 114 and 98; temperature between 99° and 97.6°; $\frac{1}{30}$ grain strychnine was given hypodermically every four hours. Liquid diet given every two or three hours. Bowels tympanitic and greatly distended during this period, for which he was given tinct. menth. pip. and asafœtida, each one ounce in three pints of water through colon tube, with good results. This was repeated as required. Bladder was irrigated daily through the drainage-tube, and the iodoform packing was removed on the sixth day. From the sixth to fourteenth day pulse and temperature were normal. Pus discharged freely from the tube, which was removed on the fourteenth day. Daily irrigation was continued, and a fresh piece of iodoform gauze was inserted after each washing. Eight hours after the tube was removed (fourteenth day) he urinated per urethram. Strychnine was given per mouth up to the 20th, when it was stopped.

December 20th. Urine passed through urethra, and the bottom of the wound is apparently healed. The external portion of the wound is still kept open with a small piece of iodoform gauze. Urine is still turbid, contains pus, and is ammoniacal; specific gravity, 1010. During the first week following the operation there was a double epididymitis, which was relieved by elevating the scrotum and applying hot fomentations.

24th. Patient is sitting up now and taking solid food.

January 5, 1902. Since last letter there has been a free discharge of pus from perineum.

16th. "The wound in perineum has completely closed. He has control of his urine, which is clear and free from pus. He is not disturbed at night and has fully recovered. I discharged him January 14, cured."—Turner.

Case VII.—Mr. C. G., aged fifty-two years, laborer, single, was admitted to Cook County Hospital December 7, 1901.

Previous History. States he was perfectly well up to four days ago.

Present Illness. Four days ago began having a dull pain in abdomen, which gradually increased until he was compelled to quit work and go to bed early in the evening. Could not sleep that night. Next morning vomited three or four times. He has had no appetite since then, and "has not been able to keep anything in stomach." About the time he began vomiting he commenced having trouble in urinating; would have desire to urinate, but could evacuate only small amount after severe straining. This desire to urinate would come on a dozen times daily, always with same result. Says he never had previous urinary trouble of any kind; denies all strictures, gonorrhœa, etc. Bowels have not been moved for four days. There is no pain in penis, no cough, no pain in chest, no headache or epistaxis.

On closer questioning admits gonorrhœa several times, and says he has had a stricture. Statements seem unreliable. Denies syphilitic infection; denies all previous illness. He was a hard drinker for thirty years; smokes to excess now. Friends of patient say that recently he has been having "flighty" spells. Patient himself says he is "silly" at times, and has been since his parents died, thirty-five or forty years ago.

Examination shows man past middle age, poorly nourished, in no apparent pain, indifferent to surroundings, mentality poor, so that little dependence can be placed on his statements. Pupils equal, but react slowly to light; teeth covered with sordes; breath foul. Chest: Heart and lungs negative. Tumor mass extending from pelvis above umbilicus, half-way to ensiform; appearance that of seven months' pregnancy; uniform dulness over this mass; no fluctuation obtainable; surface smooth; auscultation negative; tumor disappeared after catheterization; no stricture; slight urethral discharge, in which are gonococci; a very much enlarged prostate, sensitive to pressure, but not fluctuating; has all the external manifestations of an intense cryptogenic infection; patellar reflex is increased; ulnar reflex diminished.

December 7. Catheterized 11 A.M.; sixty-four ounces urine obtained; 5 P.M., fifty-eight ounces; 11.30 P.M., fifty-two ounces.

8*th*. Catheterized noon, forty-five ounces. Temperature, 98.4°; pulse, 68.

9*th*. Catheterized; thirty-two ounces obtained. Permanent catheter put in. Urinalysis: Specific gravity, 1018; reaction acid; no albumin or sugar. Leucocytes numerous; granular and hyaline casts of large size.

10*th*. Thirty-eight ounces of urine removed. Permanent catheter removed.

12*th*. Gonococci found in smear from urethral dressings. Nothing of consequence to note up to date of operation. Patient was frequently catheterized and was kept on general diet, with frequent saline cathartics. Temperature and pulse ranged near normal, but presented all the time a low typhoid condition, apparently from some hidden sepsis.

Operation was performed December 20th. 1. Lithotomy position. 2. Semilunar incision from one ramus of ischium to the other. 3. Skin reflected from apex of incision down almost to rectum, leaving triangular denuded space. 4. Fascia divided in median line down to urethra and prostate, which are located by sound held firmly in urethra. 5. Rectum separated from urethra by blunt dissection and held down by Sims' speculum. 6. Right lobe of prostate dissected free, capsule pulled back and sharp hook fastened into prostate; traction and blunt dissection used simultaneously, additional hooks taking fresh holds as the lobe rotated outward, separated from isthmus with scissors. 7. Left lobe excised in same manner, each being about the size of a duck's egg. (See Fig. 8.) 8. Middle lobe size of walnut, easily shelled out, tearing posterior urethra; escape of urine. 9. Rubber tube passed through this opening into bladder, packed around with gauze, and skin partly closed with silkworm-gut sutures. 10. Dressings and bandages.

20*th*. Patient returned from operation with pulse irregular and weak; respiration shallow—sighing; skin warm and dry, cyanosed. Temperature, 101°; pulse, 98. Strych. sulph., grain $\frac{1}{30}$, twice daily. (Figs. 16, 17, 18, and 19.)

21*st*. Patient rested fairly well during night. Liquid diet. Pulse, 98; temperature, 99°. Pot. acet., 10 grains; urotropin, 5 grains twice daily.

22*d*. Patient slept most of night. Temperature, 100.4°; pulse, 104.

23*d*. Patient resting well. Pulse, 98; temperature, 99.4°.

24*th*. Patient slept fairly well during night. Pulse, 96; temperature, 99.4°.

25*th*. Pulse, 96; temperature, 99°.

26*th*. Pulse, 100; temperature, 101°.

27*th*. Patient slept only at intervals during night. Temperature, 101°; pulse, 100.

28*th*. Temperature, 101°; pulse, 102. Perineal drain removed.

29*th*. Slept but little during night. Temperature, 100.4°; pulse 100.

31*st*. Slept fairly well during night. Temperature, 99°; pulse, 88. Strychnine sulphate, $\frac{1}{30}$ grain; pot. acetate, 10 grains; urotropin, 5 grains, twice daily; light diet. Catheter passed through urethra; bladder empty.

January 1, 1902. Patient slept fairly well during night. Temperature, 99.4°; pulse, 98.

2*d*. Rested fairly well during night. Podophyllin and calomel, each $\frac{1}{2}$ grain. Temperature 99°, pulse 98. Light diet.

3*d*. Temperature, 98.8°; pulse, 88.

4*th*. Slept only at intervals. Temperature, 98°; pulse, 96.

6*th*. Permanent catheter introduced.

10*th*. Catheter removed; perineal wound almost healed and urine passed through urethra. General condition about the same as before the operation. All vesical symptoms disappeared.

CASE VIII.—Mr. H. H., aged sixty-six years; woodworker; was admitted to Mercy Hospital December 16, 1901.

Family history is negative.

Personal History. Patient has always enjoyed good health until present illness, with the exception of a month's illness with bowel trouble twenty years ago. Patient's work has not been especially heavy, but it has been often in unheated rooms. Drinks wine and beer occasionally. Venereal infection denied. Constipation since onset of present trouble.

Present Illness. Ten or fifteen years ago patient began to have frequent urination, passing only small amount each time. Some discomfort and a feeling that the bladder was not empty often followed urination. This condition was intermittent; was less common in summer than in winter, and was aggravated by exposure and by constipation. This continued, gradually becoming more annoying last summer. It was characterized by more discomfort than ever, and increased frequency of urination. Three weeks ago patient passed some blood, clotted and fresh, with his urine; was unable to pass water for a week thereafter, and catheterized himself from that time until now. The blood has disappeared, and he cannot empty his bladder without catheter, there being about five ounces of residual urine. He urinates every two or three hours during the day and rises many times during the night.

December 17th. Urinary examination shows specific gravity, 1017; urea 1.5 per cent.; few flat and round cells; considerable mucus; pulse, 72; temperature, 98.4°.

19th. Urine in twenty-four hours, 1500 c.c., reaction acid, specific gravity, 1020; turbid; urea, 1.3 per cent.; faint trace of albumin; few squamous cells and pus in quantity. Prostate very much enlarged, particularly on left side.

Operation on January 8th; usual preparations; ether; lithotomy position. 1. Inverted Y-incision in perineum from junction of posterior fold of scrotum back to the rami at a level with the anus. 2. Rectum pushed back away from prostate with finger, and deep retractors used to expose field of operation. 3. Capsule of gland incised parallel with urethra and separated from gland by finger and blunt dissection. 4. Right lobe grasped with small hook retractor and drawn down and out and then grasped with second hook retractor; rolled out from behind forward and separated from the bladder with the finger and isthmus divided. Left lobe was treated in like manner. Middle lobe was shelled out and removed, with posterior wall of prostatic urethra; isthmus not disturbed. 5. Rubber drainage-tube passed through perineum into bladder. Soft catheter passed into bladder through urethra. Strips of bismuth subiodide gauze packed around perineal rubber drainage-

tube. One hæmostat was allowed to remain. 6. Wound closed, except on left side, by silkworm-gut. Left side left open for passage of drainage and gauze. Catheter sutured to penis with silkworm-gut. 7. Dressings and bandage. There was a moderate amount of hemorrhage. Patient returned from operating-room warm and in fine condition. Back-rest was placed under patient at angle of thirty degrees. Pulse, 78; temperature, 97; slight nausea, free perspiration. Prostate about same size and shape as Fig. 15, Case V.

January 9th. Considerable discharge of urine, some blood. Pulse, 88; temperature, 99.2°. Tubes arranged from catheter and drainage-tube to bottle. A portion of the packing was removed.

11*th.* Pulse, 80; temperature, 98.4°; tube and most of the packing removed. Patient is resting comfortably.

14*th.* Pulse is 80, temperature, 99°. Pulse and temperature have remained near normal since the 11th. Perineal drainage-tube and remainder of packing removed. Wound looks healthy. Urine passed voluntarily, principally by perineum. Patient comfortable, sitting up in bed most of time.

16*th.* Pulse, 78; temperature, 98.6°. Urine passes through perineum. Patient rests well and feels comfortable.

21*st.* Pulse and temperature normal; 270 c.c. urine in bottle. Wound clean and healthy.

23*d.* Pulse and temperature normal. Catheter removed; some urine followed through urethra; most of it passes through perineal wound. Patient sleeps well and feels comfortable.

28*th.* Patient gaining control of urine; most of urine passes through perineum, but quantity through urethra increasing.

31*st.* Patient can hold urine several minutes after desire to void is felt. Most of urine passes through urethra; small amount through perineal wound. Patient walking about and very comfortable.

February 4th. Patient has walked to dressing-room. Wound is closing, very little urine passing through it. Control of urine increases daily.

7*th.* For past three days urine has been very well controlled; almost the entire amount passes through the urethra.

Occasionally a small amount is forced through the perineal wound. Patient feels fine.

8*th*. A few leucocytes are in urine; reaction acid. He passes all urine through urethra and has good control.

Conclusions. 1. From the clinical reports and experience it seems evident that in extreme cases prostatotomy is the operation of election.

2. It appears evident that in the hands of safe, far-seeing, informed practitioners few cases will now be allowed to progress to this extreme condition before radical means are resorted to for permanent relief. The practice of to-day should be timely practice.

3. Continued use of the catheter is a menace to life, not to mention its discomfort, no matter how favorable the conditions for its performance. The patients all, sooner or later, suffer from cystitis and its sequelæ.

4. Prostatectomy gives the best permanent result, and is fraught with very little more danger than prostatotomy.

5. Suprapubic prostatectomy should be limited to exceptional cases of enormous intravesical enlargements of the prostate. It appears to us to endanger the sphincteric control more than the perineal operation. It is more sanguinary and the work is more difficult and distant from the operator.

6. The perineal is the most direct and least bloody route. It admits of a very large opening, and permits the prostate to be drawn quite into the open before it is attacked. It gives the greatest security against injury to the bladder wall and least liability to disturbance of the internal sphincter. It endangers the rectum least and affords the best drainage.

7. It can be best performed through a Y-shaped incision, with a Sims speculum for a posterior retractor. The prostate is drawn out easily with sharp hook retractors and best separated from the bladder from behind forward. The operation should never be performed in the dark—*i. e.*, through a small incision.

8. It should always be an intracapsular enucleation *en masse*, allowing the anterior isthmus to remain. The hæmostasis may be secured with forceps or a packing of subiodide of bismuth

(not iodoform) gauze. The permanent catheter should not be introduced until the perineal drain is removed.

9. The patient should be kept in a semi-sitting position for seventy-two hours after the operation, and should be out of bed by the fifth day. He should drink large quantities of water from the onset.

10. Anæsthetic is sub judice. Phosphate of sodium should be administered to keep the urine acid, and urotropin as an antiseptic. The personal equation must never be lost sight of in operating these cases, and attention to every small detail of the patient's general condition is necessary for the best results.

(I am indebted to Dr. E. F. Brandt, interne of Mercy Hospital, for the excellent photographs.)

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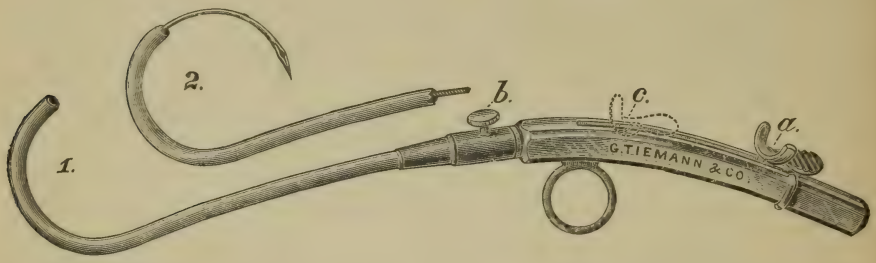
THREE NEW INSTRUMENTS.

By F. W. McRae, M.D.,
Atlanta, Ga.

NEPHRORRHAPHY NEEDLE.

As seen in Fig. 1, this instrument has a hollow octagonal handle (four inches long) with a ring beneath for index finger; a side-saddle-shaped slide on top, which is attached to a flexible steel bar that passes through a **S**-shaped tube (six inches long), and is attached to a needle which remains concealed in



the third of a circle until the above slide (*a*) is pushed forward (*c*), when the needle describes the second third of the circle, as in Fig. 2. The needle is attached to the bar by a screw-joint near *b*, so that the various sizes may be used.

All parts are detachable for easy cleaning.

The nephrorrhaphy needle was suggested by a difficulty met with in doing two operations for removal of the appendix and suturing a floating kidney in place through the ordinary abdominal incision. Practically it works very well indeed, and can be used for a great many other purposes.

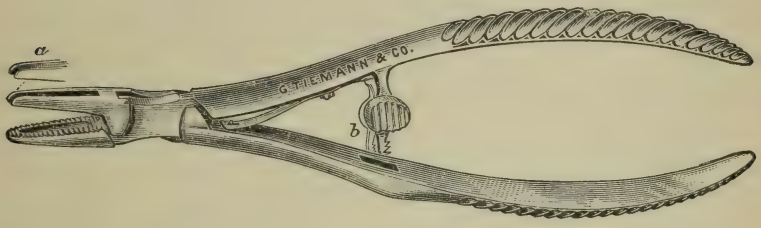
This instrument was worked out for me by Mr. L. G. Pharre, of George Tiemann & Company.

NEEDLE-HOLDER.

In this holder the lower blade is serrated; needle-surface of upper blade is smooth, and blade bifurcated, enabling any kind of needle to be held without turning or being broken; a box-lock, and a handle resembling that of a sequestrum forceps in curvature and outside corrugation.

The main features of this instrument are the position and character of control.

This is placed about juncture of distal third with proximal two-thirds of handle, and is very simple, consisting of a small bar, which hinges in a groove on the inner surface of the upper



handle. This bar has three notches on the free end that play over a catch-notch within a through-and-through opening in the lower handle, which is bulged at this point; a pin at its middle, upon the anterior end of which is placed a step-corrugated button to be pressed forward by the *thumb*. This pin plays within a notch in a small projecting plate from the upper handle. The catch-bar is regulated and handles separated by a single spring placed between the catch-bar and forceps-joint.

All parts are detachable for cleaning, and none will become loose while the instrument is being used.

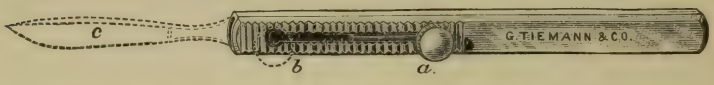
This needle-holder was devised to meet two objections to the holder of Dr. Harris, of Chicago. The release of the Harris instrument being in the handle, in a position where it is liable

to be touched inadvertently while manipulating the instrument, thus releasing the needle, and the fact that the button screws into the spring which releases the catch and occasionally becomes loose and falls off, disabling the instrument. And were it to fall off into the abdomen (as it did once for me) might become a source of delay and danger. The lock and blades are almost identical with the Harris instrument.

The rough designs submitted to Messrs. Tiemann & Company were worked out for me in a most satisfactory manner by Mr. L. G. Pharre, of that firm.

A CONVENIENT SCALPEL.

This instrument is constructed on the principle of the German veterinary-surgeon's knife. It consists of a rectangular, shell-like handle, one of its sides slipping off like the lid of a box from its grooved edges. The handle is four inches long,



the distal half is corrugated on both sides, and the one opposite to the sliding side has a one-and-five-eighths-inch slit, through which a screw (*a*, *b*) plays that controls the blade when exposed (*b*) or (*a*) while within cover.

This instrument was made for me by Messrs. George Tiemann & Company, of New York, and is an excellent knife. It can be carried in an instrument case or dropped in a sterilizer or basin without fear of injuring the edge.

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